THE ROLE OF SMALL BUSINESS IN DEFENSE MISSILE PROCUREMENT—1958

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HEARINGS

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SUBCOMMITTEE OF THE SELECT COMMITTEE ON SMALL BUSINESS UNITED STATES SENATE

EIGHTY-FIFTH CONGRESS

SECOND SESSION

ON

THE PARTICIPATION OF SMALL BUSINESS IN THE MISSILE, ROCKET, AND OUTER SPACE EXPLORATION PROGRAMS OF THE DEPARTMENT OF DEFENSE

APRIL 29, 30, AND MAY 1, 1958

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THE ROLE OF SMALL BUSINESS IN DEFENSE MISSILE PROCUREMENT—1958

TUESDAY, APRIL 29, 1958

UNITED STATES SENATE,
SELECT COMMITTEE ON SMALL BUSINESS,
SUBCOMMITTEE ON GOVERNMENT PROCUREMENT,
Washington, D. C.

The subcommittee met, pursuant to notice, at 10 a. m., in room P–63, United States Capitol Building, Washington, D. C., Senator George A. Smathers presiding.

Present: Senators Smathers, Javits, and Thye.

Also present: Walter B. Stults, staff director; Robert L. Weadock, professional staff member; William D. Amis, professional staff member; and Wiley S. Messick, counsel.

Senator SMATHERS. The meeting will come to order. We are expecting a number of other Senators to show up very shortly, but I might make a brief opening statement while we are awaiting their arrival.

OPENING STATEMENT OF HON. GEORGE A. SMATHERS, UNITED STATES SENATOR FROM FLORIDA

This is the first of 3 days of public hearings scheduled by the Subcommittee on Government Procurement of the Senate Small Business Committee. We are here today to receive information from appropriate Government and industry witnesses concerning the current status of the small supplier in our country's missile, rocket, and outer-space exploration programs. We will also examine the procurement policies and procedures governing these programs to determine if there are ways and means by which the participation of the smaller firm might be increased.

Tremendous emphasis is currently being placed upon these programs by our defense planners, and certainly we would all agree, rightfully so. Last fall our Nation was awakened to the fact that our presumed supremacy over the Russians in the fields of advanced weapons, technology, and science was possibly only an equality, and serious question has been voiced regarding even that degree of achievement. The launchings of Sputniks I and II, coupled with reports regarding Russian successes in the firing of intercontinental ballistics missiles, have created a climate which many official spokesmen view as constituting the greatest threat to our security that our Nation has ever known.

I feel that I speak for every member of this committee in stating that we were all pleased with the very positive steps taken by the

Defense Secretary at that time in efforts not only to accelerate existing programs but to press forward on new ones in order to counteract and surpass Russian gains. I know that many of you, with whom we will discuss various matters over the next 3 days, have made significant contributions to those programs which were selected by the Secretary of Defense for increased emphasis.

These circumstances have combined to quicken greatly our entrance into an entirely new era toward which, even then, we were rapidly moving. Congress has been called upon to appropriate billions of dollars for the means and methods by which our goals might be reached. While appreciating, and even endorsing, the necessity for expediting every effort in this direction, it is felt that precautionary counsel must be given our defense planners regarding the conduct of the various programs now evolving.

In the course of the swift forward strides now being made, our policymakers must not overlook that segment of the economy which has done more to preserve the free and competitive economic system upon which our country has grown to greatness than all the "household word" giants of industry. We cannot bypass that portion of our industrial society where the individually unimportant, but most significant in the aggregate, contributions have been made to every "all out" effort launched by our military in the past. I refer, of course, to the thousands of small and independent plants throughout our land in which are combined varied skills and matchless competitive spirit.

Let us not in our efforts to regain lost ground create, for the decades to come, an economic structure which would concentrate in a handful of huge corporations the bulk of the productive capacity of this country. Within the demands of our security we must guard against permitting a few contracting officers inadvertently undoing the combined antimonopoly work of the Department of Justice and the Federal Trade Commission.

It is axiomatic that those who are charged with the responsibility of directing our military and scientific efforts would be gravely remiss were they to turn their backs on the vast talent residing in the thousands of small firms desirous of making a contribution to the common goal. An examination of the extent of the participation by small business in the missile field to date suggests a lack of understanding, by some, of the nature and extent of the capabilities of many companies classified as "small" under the current numerical criteria. The military services claimant program statistics for fiscal year 1957 reveal that under the "Guided Missiles" category the Army gave only 4.5 percent of its prime contract dollars to small business, the Navy less than 3 percent, and the Air Force an insignificant eight-tenths of 1 percent.

While the testimony received during the course of the next 3 days may indicate the contrary, this committee currently holds to the belief that certain of the more significant factors which have heretofore precluded small-business participation in, say, the field of airframe manufacturing, do not exist in the production of missiles. Here there are no production runs totaling thousands of units, requiring acres of plant space and tens of thousands of assembly line workers. The comparatively modest number of end items involved would indicate to this committee that the potential for firms having 500 employees or

less, is far greater in the missile field than in the area of aircraft or tank manufacture.

The system of utilizing small-business specialists throughout the military services and the general procedures being followed under these programs have been made clear to the members of this committee. We acknowledge that such a system exists. Recent statistics, however, from the Department of Defense, covering the share of prime contract dollars going to small business strongly support the conclusion that the system is not accomplishing its purpose. In fiscal year 1957 small business received a wholly inadequate 4.3 percent of the total dollar value of research and development prime contracts. For the first 8 months of this fiscal year this percentage is down to 2.6 percent, compared with 3.4 percent for a similar 8-month period in fiscal year 1957. In production prime contract awards small business received 19.8 percent of the defense total in fiscal year 1957. For the first 8 months of fiscal year 1958 this total is only 15.3 percent, compared unfavorably, I should add, with 16.7 percent for a comparable 8-month period in fiscal year 1957. We trust that every possible effort is now being made by each of the military services to return small-business share to the modest levels reached during the previous fiscal year.

Expenditures for guided missiles, rockets, and other advanced weapons have gushed from the mere trickle of a year or 2 ago to the flood of today and tomorrow. It is our fear that the breadth of thinking, regarding the impact of these purchases, has not similarly grown. We ask no handouts to small business; we do wish to focus attention, at least momentarily, on the contribution that these independent businesses can make toward the reemergence of American scientific and technological supremacy. Over the years, our committee has found repeated instances of the ability of alert and imaginative entrepreneurs to solve in a matter of minutes and pennies what some of our largest corporations were puzzling over for days and months.

This committee wants to help the agencies of the executive branch of this Government to help small business. With regard to the types of procurements which will be discussed during this set of hearings, it is necessary for us further to acquaint ourselves with the subject. To inform us of exactly what is taking place in the missile picture I believe we have asembled an excellent array of witnesses. Armed with what we will learn about this subject from these experts, it is my hope that the committee can jointly develop with the procurement policymakers means by which the smaller firms can make a more significant contribution to these undertakings so vital to our country's security.

The committee is very pleased to have as its first witness, Mr. William M. Holaday, Director of Guided Missiles, Department of Defense.

Senator SMATHERS. Mr. Holaday, you may proceed any way you like.

STATEMENT OF HON. WILLIAM M. HOLADAY, DIRECTOR OF GUIDED MISSILES, DEPARTMENT OF DEFENSE, ACCOMPANIED BY BRIG. GEN. A. W. BETTS, UNITED STATES ARMY, MILITARY EXECUTIVE ASSISTANT TO MR. HOLADAY

Mr. Chairman and members of this committee, I am W. M. Holaday, Director of Guided Missiles, Department of Defense. As such I have been delegated the authority of the Secretary of Defense to direct the national guided-missile effort with respect to its research, development, engineering, and production. I am also responsible for our national guided-missile effort, providing the missiles and missile systems we need when we need them and with the required performance and effectiveness. To do this job requires the use of the best competence of our Nation, be it small, medium, or big business, university or Government. I want to emphasize that there are many areas of missile work where, inherently, small business just cannot do the job as a prime contractor. The jobs are too broad for their abilities, resources, and personnel. Since we are not able to break the prime contract down into smaller bites that small business can handle, the capabilities of small business are best used at the subcontractor level.

At subcontractor level, small business has played and continues to play a vital part in our missile programs, both in development and production. I will elaborate later on the rather unique competitive advantages of certain small businesses over their mass-production, big-business competitors which results from the specialized needs of the missile projects. Representatives of the military departments who follow me will treat more directly with this contribution to our projects and with the proprietary position which such small organizations have gained under free competition, under conditions where they have earned this position.

We have been in missile work in this country since World War II. Since that time, we have built a new technology, brought along our sciences, developed a vast array of components and devices, and learned how to build these together into some of the most complex and capable weapon systems so far conceived by man. Dollarwise, we have grown from an obligation rate of $60 million in 1947 to a $1,200 million obligation rate in 1952 to a $5 billion a year rate this year.[1]

We now have in use 3 types of air-to-air missiles, Sparrow, Falcon, and Sidewinder; 2 types of surface-to-air (antiaircraft) missiles, Nike-Ajax and Terrier; an air-to-ground missile, Rascal; and several surface-to-surface missiles which are based on both rocket and aircraft technology, Honest John, Corporal, Matador, and Regulus. Closely following these first missiles in production are second-generation weapons incorporating our expanding technical ability and matched more closely to the using military organization needs—incorporating what we have learned from using the first generation of weapons. In our development laboratories are our third-generation missiles, and we have a major research program directed at providing even greater capabilities. Small business is involved, contributing critically needed ability throughout the entire missile program, to all types, and to all generations. Our management procedures are not acci-

[1] See supplemental information supplied by Hon. Perkins McGuire, Assistant Secretary of Defense (Supply & Logistics), exhibit 5, p. 46 and exhibit 5 (b) p. 53.

dental, but determined by experience and by careful thought to be the ones we need to get the weapon job done.

Without detailing each peculiarity or requirement of missiles, a tabulation of factors critical to this work provides a better understanding of why we develop, build, manage, and contract for these weapons the way we do. I list the following factors:

Missiles utilize almost every science and technology to the maximum of our knowledge and skill.

Missiles demand high, uniform, and repetitive quality.

The environment criteria is much more severe than for conventional weapons.

Missile tolerances are, generally, an order of magnitude 10 or more times more exacting than the weapons they replace.

The materials used, the tolerances, and the quality establish peculiar manufacturing needs.

The complexity of both the missile and its operating system is generally of the highest order.

We strive for infallibility—assurance of reliability.

We have found it justified to pay for premium quality and workmanship when it assures high operability and reliability of the missile and its system.

There is a high single-shot cost—and high single-shot loss in case of flight failure.

Because of the very rapid advance in the technical state of the art, we have high obsolescence rate—technical growth frequently exceeding prediction.

We must build shelf life, operability, and preventive maintenance into the weapon to minimize demands on military manpower.

The missile weapon system is characterized by the close working interrelationship of all parts, working properly, together, and with high reliability when called upon.

Finally, as a result of our experience in the engineering refinement of our missiles, we have found a steady trend to divide the missile system into parts which can be manufactured separately, according to established skills, and later assembled into the complete weapon.

We have tried many variations of contracting over the years. Some early weapons were procured as small items and components and assembled in Government plants. At the opposite extreme, complete missile systems have been contracted to a single organization to research, develop, and produce. We have built integrated factories that could make and assemble a missile from materials and standardized components, and we have built assembly plants predicated on all assemblies and parts being subcontracted. By using our experience, there has evolved our present pattern of contracting, which seems to do the best job in providing a complete missile system. While we have some variations in development, whether to develop in a laboratory with industrial assistance and then go to industry for production, or whether to go to industry for the development job as well, there is reasonable agreement that procurement must be for large parts of, if not complete, missile units, in order to assure compatibility of the components. Inherently, this has forced us to the business organizations with large engineering staffs, companies of considerable size, certainly much larger than 500 employees.

In my own industrial experience, I have encountered what is called the "make-or-buy decision," the determination of whether to subcontract or whether to do the job "in house." Ideally, this decision is based upon which way is cheaper and which way is best—most assured of delivering the right product on time. The complexity of our missiles and missile systems results in the prime contractor having relatively few of the array of skills and manufacturing capabilities needed for the complete job. Rather, the prime has the ability to manage the job, to provide the overall technical control to the product, to insure the proper interrelated operation of all the missile and missile-system parts. The prime has the responsibility for breaking down the overall job into segments that can be delegated, be subcontracted to other organizations for design or manufacture. The prime, in turn, knits the output of all the supporting organizations into the product we need.

The high technical requirements of the missile assemblies and components, coupled with the relatively modest quantities procured, tends to mitigate against the large, conventional, mass-production business and provides a competitive advantage to the small business with limited but high-quality production.

In summary, our task is to develop missiles which have the required performance and reliability and which are ready for use when needed. In order to make the most efficient use of American industry, we must design and engineer the missile systems into parts whose technical and manufacturing needs are matched to the skills of our industry.

Our program is aimed at making available to the small-business man, and to all other business, knowledge of the specialized technical, quality, and fabricating requirements of the missile program and to identify for him the organizations who are in need of his abilities, who are making the products which use his skills. If we bring the buyer and seller together, our established business procedures under free competition will insure small business receiving its full share of the missile work. I am also confident it will insure our missile projects receiving the full support of highly skilled and competent small business.

Senator SMATHERS. Mr. Holaday, you have said in your statement:

We have built integrated factories that could make and assemble a missile from materials * * *.

That is the Government that builds those?

Mr. HOLADAY. Those are some where Government money is put into them, along with the contractor's money. This is not all Government money. Usually, what we provide, Mr. Chairman, is the machinery. This is not a fixed case, but, usually, we supply the special machinery. The contractor usually provides the other part of the hardware, the buildings, primarily, and the areas.

Mr. Chairman, in addition to this, at the request of your staff, we have prepared a briefing which can be given by General Betts [2] here at your convenience on the entire missile program, showing what missiles are being worked on, the progress we have made up to date. To properly present this, we believe it should be given in a closed meeting in order that you could have available information of dates and times and numbers. So, at your convenience, whenever you would

[2] Brig. Gen. A. W. Betts, United States Army, military executive assistant to William M. Holaday Director of Guided Missiles, Department of Defense.

like to, we would be glad to present this briefing to you in a closed session.

Senator SMATHERS. Thank you very much, Mr. Holaday. We will want to ask you some questions before you leave.

Now, General Betts, in order that we not disrupt these proceedings at this point, if you don't mind, just stand by and, when it is convenient, we will call on you and get the information from you.

General BETTS. As you wish, Mr. Chairman.

Senator SMATHERS. Senator Javits, do you have any questions?

Senator JAVITS. Yes; I do.

I notice that you refer in your statement to a $5 billion rate of procurement, Mr. Holaday. Now, how can we equate that in terms of proportion of the effort of the United States in respect to its defense? Should it be compared to the roughly $40 billion appropriation, or should it be compared to an aggregate for weapons system? Would you compare that, so we could get an idea of the proportion of defense effort which is now in this field?

Mr. HOLADAY. Well, I think there are several procedures or methods of doing that. I am not sure. Of course, one is the $40 billion defense budget. This is $5 billion for missiles. However, in the entire defense budget is the maintenance and operation costs, so we probably should break it down more to compare it with all other pieces of equipment, like buying ships, submarines, aircraft, and things of this type. I do not have an exact breakdown of that. However, we could acquire that for you.

Senator JAVITS. Just to give us an idea in round figures, does this represent a one-third, or one-quarter, or something like that, of the aggregate of the latter field of expenditure?

Mr. HOLADAY. Just give me a second now until I try to collect my thoughts together a little bit on this. We will have to recheck this. This is about $5 billion out of $30 billion in buying this hardware.

Senator JAVITS. That would be about one-sixth of that effort.

Mr. HOLADAY. Yes, sir.

Senator JAVITS. Now, one problem I would like to call to your attention and get your answer is the question of replacing with the aircraft manufacturer the missiles work for aircraft work. Now, I will give you some very practical examples, because it happens to be very pertinent to my own State. We have a large aircraft manufacturer in two centers, Buffalo and Suffolk County, Long Island, N. Y., and there have been tremendous cutbacks in employment in both areas, with marked distress in those areas. The cutbacks have resulted in unemployment in the Buffalo and Suffolk County areas of about 15 percent in manufacture. That has been the overall effect. In terms of the individual companies involved, they are employing one-third of the number of people that they have employed normally in their aircraft procurement.

Now the question is: Is any conscientious effort being made in missile procurement to endeavor to substitute work for those who have lost it, or is this business just going wherever the bidders ask for it, or, you know, are entitled to it, based upon their low bids?

Mr. HOLADAY. Well, Mr. Senator, the problem here, as you well realize, isn't a problem that that would affect. A large proportion of our missiles are produced by the aviation industry. This has been a logical step, I believe, in the operation. It is very difficult, however,

in reducing the amount of effort on aircraft, to make that always jibe with the increase of amount of effort on missiles. For instance, interceptors have probably been cut back at a much faster rate than we know bombers have. In the missile business, it is somewhat of a specialized proposition. I don't think 1 man in the missile effort would necessarily take the place of 1 man in the aircraft industry. I would like to better explain that by an example, taking a missile like the Thor. The main tanks and structure are made by the Douglas Co. The nose cone that is used on Thor is produced by General Electric, who have the best knowledge and know-how to make a nose cone and have it absorb the heat as it comes back into the atmosphere. The guidance is made by the A–C Spark Plug. The engine is produced by North American. Thor is thus broken up in the areas of specialization and Douglas, in turn, brings the parts together.

Now, in the question of missiles, we not only are talking about ballistic missiles, but also about aerodynamic missiles and decoys and things of that type. The first consideration, I would say, is to put the business into that area where the specialists are. In nearly all cases, this turns out to be the people in the aviation industry. They have known how to make weapon systems. They have the engineers and they are capable. So, I would say that, in general, this has been the direction in which we have moved—that is back to the aviation industry.

Senator JAVITS. Nonetheless, I find that the weight of contract award has shifted from my part of the country in the East to the Pacific coast, and, whereas the employment has been very sharply cut back in the areas that I have described, the employment is not as sharply cut back or is holding up on the Pacific coast because they seem to be attracting the business. Now, this affects small contractors as well as large ones. Is there any fundamental reason for that? I don't say this critically at all, Mr. Holaday. We are dealing with facts of logic, and I am trying to get at what we can do about it rather than criticism of the people operating the program.

Mr. HOLADAY. I wish I were more of an expert to answer your question. You have me in aviation problems, while I specialize mostly in missile work. But is it not true, as I recall from my knowledge of the aviation industry in the two areas that you are talking about, that both of these companies have been builders of fighters and interceptors, which are the areas that have been cut back?

Senator JAVITS. That is right. It is the Republic and Bell that I have been asking about, mostly. I am asking how they figure in the missile program in order to take out some of the fall off in the aircraft program and what we can do about it.

Mr. HOLADAY. As I recall, we do have some of our decoy work back in the plants here in the East. But I think this problem has been primarily due to a rapid dropoff in the interceptor and fighter, which, on the whole, on the west coast, has not been quite so drastic. We did make an awful lot of fighters and interceptors in the eastern and midwestern plants. The big bombers have been on the west coast.

Senator JAVITS. Would you say, therefore, the difficulty is that these people had not retooled or otherwise prepared themselves to participate in your program, thus taking up from where they left off in the aircraft fighter program?

Mr. HOLADAY. In general, that is probably true. They are in, and very actively now, a number of our programs. They are becoming very active now in our missile work.

Senator JAVITS. Is there anything we can do to accelerate their adapting themselves for this business?

Mr. HOLADAY. No; I haven't anything to recommend, Senator. They certainly have been quite active, themselves, in coming in and talking to us, and we are trying to keep them advised of the programs that will be worked on. We spend considerable time doing this.

Senator JAVITS. Do you feel they need financing and other help from the United States to get in shape to participate reasonably in the new trend of our defense production?

Mr. HOLADAY. No; I couldn't answer that question for you.

Senator JAVITS. Would you undertake, Mr. Holaday, to look into it. Again, I emphasize I have nothing in mind but the most constructive objective. I really want to find out how we can enable them tomorrow to get a fair share of this work and not have the sharp, and I must tell you, very deleterious effect upon their home communities which they are now experiencing with the sharp layoffs they are having today. These have been very badly hit communities and, apparently, the Bell communities have operations which have declined very sharply. So, if you would be good enough to let us know how we can constructively help, by legislation or something else, I would appreciate it. I know it has not only affected those of us in the East—it doesn't only affect New York, but other places. We will all be deeply interested in your suggestions.

Mr. HOLADAY. Yes, sir.

Senator JAVITS. Mr. Chairman, I have one other question, and that is a general question to Mr. Holaday.

Are you satisfied, Mr. Holaday, with our progress in these missile fields? I say that, generically, for this reason; we have been so obsessed with the recession, which is certainly important, but still obsessed with it, so, in my opinion, we have almost forgotten the issue of national survival, which we faced last November and are still facing. I would like to know if you have any word for us on how you feel you have been catching up since the time when we first became alarmed, which is, roughly, the period of last September to November.

Mr. HOLADAY. Well, we have had lots of problems, as one would have in a large and integrated program of this type. Our progress has been very excellent. We think we are making very excellent speed in the overall program. I think this is measured to a great extent by the testing which we are able to do now. Some people worry about the number of flight tests that we make down over the islands. This is building up our confidence in our programs. We are getting more and more flight tests, collecting more and more data, becoming more and more competent in our weapon systems than we had ever hoped. In the work of employing our IRBM missiles, the Jupiter and Thor will be displayed during the latter part of this year and the first of next year with our allies in Europe. The ICBM Atlas is following right along and should be deployed during 1959. The progress is good. We have lots of problems. I am not saying that we don't have lots of problems, but these are being solved by our engineering people getting in and testing these programs.

Senator JAVITS. Is our rate of progress accelerated or decelerated since you first estimated it or made your views public last fall? Are we moving faster or slower than you estimated before?

Mr. HOLADAY. Well, it has been accelerated, sir. To answer your questions, we have to answer that way. I assume, since we are spending more money, we are making faster progress. We have more people in the program. All of these programs have been moved ahead, and we are quite confident that we are going much faster now than we did before.

Senator JAVITS. Do you have many pressing shortages of money or people?

Mr. HOLADAY. No, sir.

Senator JAVITS. Thank you, Mr. Chairman. I'm sorry I took so long.

Senator SMATHERS. That is quite all right.

Mr. Holaday, just for our information, have you ever had any experience as a small-business man? Have you ever been what would be classified as a small-business man?

Mr. HOLADAY. No, sir; I have not.

Senator SMATHERS. That has not been your background; has it?

Mr. HOLADAY. No, sir; most of my life has been with large corporations.

Senator SMATHERS. In the present position which you hold, in addition to these items which you have mentioned, you are, as director of this program, also in charge of all the procurement in connection with this missile program?

Mr. HOLADAY. The broad phases of this, I would like to say, are our responsibility. We do not go down through all the details. It goes down through the Office of the Assistant Secretary of Defense (Supply and Logistics) into the services. There are many layers of control and operation in the procurement phase.

Senator SMATHERS. But, generally speaking, you are the one in your Department, and your Department is the one that generally lets contracts and things of that nature; is that not true?

Mr. HOLADAY. No; our Department is not a contracting agency. Our Department has no money whatsoever. We are setting only policy. The money is appropriated by the Congress to the military services and the military services do the procurement.

Senator SMATHERS. Then, as I understand it, you merely state what it is that you want, and you turn over the job of getting what you want to one of the military services?

Mr. HOLADAY. Yes, sir.

Senator SMATHERS. And you, in effect, do not supervise or directly let any contracts?

Mr. HOLADAY. That is right.

Senator SMATHERS. On page 4 of your statement, you say:

> Finally, as a result of our experience in the engineering refinement of our missiles, we have found a steady trend to divide the missile system into parts which can be manufactured separately, according to established skills, and later assembled into the complete weapon.

Would that trend seem to indicate to you that there would be some prospects for small business to participate to a greater extent than they are now doing in this program? The trend to have items manufactured separately. Would that not give some hope to small business?

Mr. HOLADAY. Certainly, it is no handicap to small business. I would certainly agree it falls in the direction of small business. We have found, sir, as I pointed out, that, on something like the Thor missile, there just isn't any corporation large enough to incorporate all the skills required. The guidance system for a missile like the Thor requires a very highly skilled engineering group to design it in the first place, and then requires very high skill for the production. This, of course, is breaking the missile and the missile system down into more and more components. This, I think, has the great advantage of spreading our missile business throughout our entire industry, large and small. I think the more you break the missile down the greater chance there is for all people to have their share.

Senator SMATHERS. Do you have any idea, or does somebody with you have any specific information, as to how much this missile program is actually being subcontracted to what we could define as small business?

Mr. HOLADAY. Some of the people that will follow me, I think, have some information on this. Unfortunately, as they tell me, our bookkeeping does not keep all of these details. Now, as I understand it, some of the contractors that will report to you have fairly complete details on a large missile system; as an example, how well it is broken down. But I don't believe that the Department of Defense keeps all of these records completely within the Department of Defense. I believe we are going to have to rely on some of the contractors to break a contract down and show you in detail how that particular contract is broken down.

Senator SMATHERS. Do you, as a Director of this program, believe it is important to have small business have whatever practical part it can have of your program?

Mr. HOLADAY. Yes; I have to agree with that, because I have encountered some of the small-business people and have conducted discussions with them and know the parts they have played. Some of them have played very important parts. Take the Atlantic Research in Alexandria, Va. It is just a small unit, primarily a technical organization, that has grown up and is playing an important phase in our work. They are doing outstanding research and development work now on the fuel program. We realize their importance.

Senator SMATHERS. In other words, your economic philosophy and beliefs are that small business is important to the Nation's economy?

Mr. HOLADAY. I certainly do; yes, sir.

Senator SMATHERS. And, because you believe that, you will be interested in having the Department and the people over whom you have direction—you would like for them to be alert to those opportunities of giving to small business additional business?

Mr. HOLADAY. Yes; I feel that way. I have felt that my own staff, which is rather small, and the staffs through the Department of Defense in the military services have this at heart. They certainly discuss it very thoroughly with me and I feel they are all working hard to make this successful.

Senator SMATHERS. Have you ever taken the occasion to express to them your belief that small business should have as large a part in this program as is practical?

Mr. HOLADAY. I don't know that I can say that I have said it just that way, but my interest in working with them and talking to them, I would think would imply that very definitely.

Senator SMATHERS. You would have no objection to stating that specifically to them on the next occasion when it would be appropriate; would you?

Mr. HOLADAY. No; I wouldn't hesitate.

Senator SMATHERS. I think the small-business communities around the country would be greatly encouraged, Mr. Holaday, if you would make such an expression. Then, of course, you, being a very important man and having all these other people working under you, whatever you say along that line would, in effect, amount to even a directive to many of those people below you to see that small business did have its proper share of the missile program. So, if you could find some opportune time to make such a statement, it would be very helpful; because you say you believe it should and I am sure that is what you mean.

Mr. HOLADAY. Yes, sir.

Senator SMATHERS. Do you have any questions, Mr. Weadock?

Mr. WEADOCK. Yes, sir.

Considering your opening statement indicating the delegation of your authority by the Secretary of Defense, in your testimony before Senator Johnson's Armed Services Subcommittee, the counsel for the subcommittee read to you at that time a Department of Defense directive indicating your responsibilities. I would like to quote from the transcript of those hearings:

> The Director of Guided Missiles will direct all activities in the Department of Defense relating to research, development, engineering, production, and procurement of guided missiles.

In connection with that, during the course of these hearings we, of course, want to talk to the top policymaker in the procurement field with regard to guided missiles. Is this in effect your responsibility? Would it be Secretary McGuire or just whom should we address our specific procurement questions to?

Mr. HOLADAY. Well, sir, I would like to go on a little further in this same directive that I think will help to answer your question.

Mr. WEADOCK. Surely.

Mr. HOLADAY (reading):

> The Relationships and Organization: (A) The Director of Guided Missiles will report directly to the Secretary of Defense.
>
> (B) The Director of Guided Missiles will utilize existing staff organizations within the Office of Secretary of Defense, including appropriate staff members of the Assistant Secretaries of Defense for Research and Engineering, Properties and Installations, Supply and Logistics, Comptroller, and the military department, insofar as they may be necessary to carry out his assigned functions.[3]

I read that to indicate that in this question of procurement—Mr. McGuire is on our missile "board of directors." He is the main person that we turn to and he advises us in this question of procurement. In other words, while the responsibility falls on my shoulders, I can't carry all of this. My shoulders are not quite that broad. Mr. McGuire is the man that we turn to to assist us in the question of procurement. So I would say that Mr. McGuire would be the

[3] See exhibit 1 p. 19, for full text of the directive.

person to answer specifically that phase of it. He is handling the procurement phase.

Mr. WEADOCK. You make the final decision, however; is that not correct?

Mr. HOLADAY. Yes, sir; if there are any questions.

Mr. WEADOCK. And when you are advised by Mr. McGuire, would that be during the course of meetings of the OSD Ballistic Missile Committee? Is it in effect the responsibility of the committee to advise you; with you making the final decision? Is that the relationship?

Mr. HOLADAY. Yes; this committee is a broad policy and action group. So that could take place during a normal committee meeting or it could take place in our normal daily meetings, telephone conversations, and what have you. In fact, I was talking on some of our work to Mr. McGuire for some 15 or 20 minutes this morning before I came over here.

Mr. WEADOCK. Mr. Holaday, since you do acknowledge that you have the final decision in these matters, incorporating research, development, engineering, production, and procurement, are you personally familiar with the small-business program being conducted by the Department of Defense? Do you have intimate knowledge of that program?

Mr. HOLADAY. Well, I have a knowledge of it. I certainly have during the last year or so that I have been in the guided-missile area had many conversations with the men that are working in this area, on the type of work they are doing. They sometimes explain to me some particular case they are working on and what has been done on it. I have not read in detail probably all the law or rules and regulations on it, but I have worked close enough to know right up to date what is going on.

Mr. WEADOCK. Mr. Holaday, let me read just very briefly part of Public Law 163, and I quote:

> It is the clear policy of Congress that the Government should aid, counsel, assist, and protect insofar as is possible the interests of small-business concerns in order to preserve free, competitive enterprise, to insure that a fair proportion of the total purchases and contracts for supplies and services for the Government be placed with small-business enterprises.

Now, I think statistics will reveal that less than 2 percent of the roughly $5 billion, which you refer to as being expended in the missile field this year, will have actually gone to small business in prime contract awards. In your personal judgment do you believe that is a fair proportion for small business, considering the vast numbers of small businesses and considering the skills and talents inherent in those businesses?

Mr. HOLADAY. Well, sir, I think I have to agree that it is a fair proportion due primarily to the types of talents and skills required in the missile program.

Mr. WEADOCK. You believe that there is no room for improvement; that small business can only count on 2 percent from here on to the point where 50 percent of our defense budget will be apportioned to missiles, rockets, and related items?

Mr. HOLADAY. I don't know that I am in a position to say there is no chance for improvement.

Mr. WEADOCK. But, you feel it is a fair share at this time?

Mr. HOLADAY. It is a fair share at the present time. I am not real sure of that number that you are quoting there.

Mr. WEADOCK. The 2 percent, Mr. Holaday?

Mr. HOLADAY. Yes; I will assume that is taken from our records, that it is perfectly O. K. But we are talking about that as an area. The prime contractors are the ones that we have to put our main pressure on to get them to subcontract to the small-business men. In other words, we can't run down every contract personally ourselves. But to the prime contractor, they are the ones that we keep the pressure on to keep putting this business out and dividing it up as fairly as we can and to use the talents of small business. The talents are the things that we are striving for.

Mr. WEADOCK. Mr. Holaday, the law and the intent of Congress doesn't say anything about subcontracting. They say, "a fair share of the total purchases." These are the Government purchases or contracts. These are not subsequent purchases of contract and it would be helpful for this committee to be able to understand exactly what we have to look forward to. I have every reason to believe we will receive testimony perhaps later this morning somewhat contradictory to the position that I assume you have taken, that 2 percent is, in effect, under the current system, a fair share. This prompts the question of whether it is the system that causes this condition or whether it is the inability of small business to make a greater contribution. There have been many observations to the effect that this system, which is of our own making, the weapon-systems concept, is the thing that precludes small business rather than their capabilities or inability to perform. Each of the military services in our rather brief review of this area have elected to follow perhaps different contracting procedures with regard to the initiation of their missile programs. As Director for the entire effort, do you feel inescapably you must adhere now to the weapon-systems concept, and this will be prescribed for all the services?

Mr. HOLADAY. I wouldn't say that for sure that is going to continue but our success in the time that I have been associated with it almost makes that imperative. If we are going to try to carry on and bring up these missile systems, which are quite large, it requires large engineering and technical staffs to make this happen. I am trying to follow your point and see where it would be possible for any corporation of less than 500 people to take on a missile program that was running a billion dollars a year.

Mr. WEADOCK. But in your own statement, didn't you say there is a steady trend to divide these missile systems into various components?

Mr. HOLADAY. That has to be done by subcontracting though. We can't divide them up. The prime contractor has to contract down into subcontracts in order to make this missile fit together. That is the reason we are going to the missile system so it can be put back together and make it fit and not have a bunch of gears that clash and won't fit together.

Mr. WEADOCK. Mr. Holaday, we have received some preliminary information from the military services. I think in one of the Navy missiles, I forget the exact name of it, there was something like 10 or 11 prime contracts. These were by the Government. This was Government-furnished equipment. They were supplied—several of the components that this was broken down into—these were supplied by

small business. What would you have to say about what we hope is a trend in this direction?

Mr. HOLADAY. You don't remember which missile system this is?

Mr. WEADOCK. No, sir. I regret I can't recall it to mind.

Mr. HOLADAY. If you can get it, I would certainly be glad to try and write the answer up for you. I think you should have it and if you will look it up in your office, I will be glad to do that for you.[4]

Mr. WEADOCK. A final question, Mr. Holaday: Do you foresee a time in the acquisition of missiles when perhaps specifications and drawings of the component parts will reach a stage of accomplishment whereby these things will ever be able to be put out on a competitive basis or are we progressing so rapidly and abandoning missiles so swiftly to move on to the next generation, that we will never see this?

Mr. HOLADAY. Well, I think we have to face the facts of life. I feel just like you do. I always feel like we ought to get standardized; but by the time I think we are standardized, that part is obsolete and somebody has new ones. I think we have to face the facts of life. This is the way it is going. We don't have any missile system that is stabilized where there isn't a new one that is going to come along and displace it.

Mr. WEADOCK. That does suggest one additional question, Mr. Holaday. On page 5 of your statement in the first paragraph in the third sentence, you indicate that the prime—

> has the ability to manage the job, to provide the overall technical control to the product, to insure the proper interrelated operation * * *

Here is a situation whereby the prime has these responsibilities of management plus the very tangible responsibility of perhaps producing an appreciable component of the end item. A different system whereby perhaps a group of technical experts were drawn together into a company which had no procurement functions but did have the responsibility for seeing to all the points that you bring out here, bringing all the components together and inspecting them, and insuring their suitability and then delivering to the military an end item, do you think there is any future for an activity of that nature? The thing we would like to guard against, that we have noted in the immediate past, Mr. Holaday, is the inclination of these giant corporations to self produce a lot of items that historically they have never produced before. They build no plants but come to the Government and want some help on establishing new facilities. They place advertisements in the New York Times asking for new engineers. They build themselves a little empire at the expense of a Government contract, you might say. Could not this be avoided if perhaps you had a technical group in between the Government and prime contractors, and let the primes continue to do that which they have historically done, rather than let them get into an entirely new field? It may be that we might not have time for that. I don't know. I am sure your judgment is far more keen on that than mine.

Mr. HOLADAY. Well, sir, we have that to a certain extent. To support the Air Force when it started its Atlas and Thor programs, we employed a technical organization, named Woolridge, which is an engineering technical group, to assist the service. They assist the military people in making their technical decisions and in working

[4] This information was subsequently supplied to Mr. Weadock.

with the corporations that make those missiles. This has been quite successful and I think very helpful in a large program of this type. This is where you are adding technical help and support to your military. Now, most of the time the military have the technical competence to push these programs along in very good shape but we have found this method successful. Now how long we will continue it, and how much more, if any, will be added to it, I don't know. But this is one way of adding technical competence and keeping the work properly adjusted, pulled together and also spread out, if you will, to get it in the hands of people having technical competence to do the job. I don't know how much more we will do but this effort has been very helpful.

Mr. WEADOCK. Mr. Holaday, do you suppose in keeping with your responsibilities and the delegated authority that you have from the Defense Secretary as to the procurement of guided missiles, we could prevail upon you to become more interested in the problem that causes the chairman to convene this meeting today? That is the interest of small business in getting a larger share in the missile program?

Mr. HOLADAY. Well, that is a loaded question. Excuse that offhand comment, sir, but I don't know how to answer you and say I could devote more time to it.

Mr. WEADOCK. Not necessarily more time, Mr. Holaday; but a graver consideration of this problem which we feel is very compelling.

Mr. HOLADAY. Well, I certainly have put in a fair amount of time on it and I have a very definite interest in it because a lot of my friends are in the small-business world even though I haven't been in the small-business world myself. I think within our own staff we have had it as an interest. For instance, I found out after I came into the Department of Defense that one of the hardest things to do is to find out who is doing something. The contractor came in and if you wanted to find out who was doing something, "Where can I go and talk?" This we had very poorly organized. We have worked on trying to release this information. I don't know whether these have been supplied to you or not but they are releases which we have made to industry telling them where a particular missile is being developed and who to go see if they want to get into that particular business.

Now, I would like to point out that this is a very important start to understanding a missile or missile system such as the Nike-Ajax. We quite often think only of the missile. Well, for probably every dollar we spend on the Nike-Ajax missile per se, we probably spend $2 and maybe $3 on all the other ground support equipment that goes with it to deploy it.

Mr. WEADOCK. Under the weapon-systems concept, that would go to the prime contractor?

Mr. HOLADAY. To the prime contractor.

Mr. WEADOCK. Even to the training of crews; rather than training by educational institutions? We understand that this feature would also go to Republic Aviation—or whoever the prime was.

Mr. HOLADAY. That may be true. I think that is the situation on the missile, that we have been accelerating our effort on during the last 6 months or so. We think it has been quite helpful to a number of people we have talked to.

Mr. WEADOCK. Mr. Holaday, undoubtedly that is helpful to perhaps maybe what you call the next generation; but by the time the

Department of Defense is in a position to announce who has received what contract, the prime awardee has pretty well gotten his subcontracting structure pulled together; don't you believe? As a matter of fact, is this not one of the considerations taken by the military in awarding the contract—the capability of the subcontractors to do that which he is offering to subcontract? What good does that information do to a small business who would like to go to a prime and get a part of that $100 million Government contract? He is about 6 or 8 weeks too late on that.

Mr. HOLADAY. I don't think we can generalize that the contract would be let to some prime just because a subcontractor might be along with him. This, in certain cases, may happen and in certain other cases it may not happen; because you put the main load on the prime contractor to come up with the finished product. But in giving the prime contract, the services are certainly going to indicate who some of the subcontractors are going to be. Particularly, for something like a guidance system, the nose cone, or the engine, the military would approve those subcontracts. Thus subcontracting keeps on going down from the subcontractor to lower subcontracting levels.

Mr. WEADOCK. In this general area, Mr. Holaday, we have reason to believe that it would be much more helpful to the small-business man if perhaps this "need-to-know criteria" which is established in connection with the ASTI Agency were modified a bit. We have had a number of complaints about this. I say this to you seriously about what has been going on with respect to ASTIA.[4a] You have a condition where a man can't get knowledge about a contract because he has no necessity for it. He doesn't have a contract and he doesn't require that additional information. He is estopped from proceeding further to acquaint himself with more technological facts which would put him in a position, once he had absorbed it, to qualify himself for additional contracts. I don't know whether this falls within your purview. We are trying to establish who is the boss here; whether it is you, sir, or whether it is the Assistant Secretary for Supply and Logistics. We do have some very specific questions to resolve. You say you experienced this yourself when you first went to the Pentagon—trying to know who does have the final say. If this is not in your area, I apologize, but I would be grateful if you would indicate with whom we might discuss this matter of technical information.

Mr. HOLADAY. On the technical information; not the procurement part of it?

Mr. WEADOCK. Yes, sir.

Mr. HOLADAY. The "need to know." This has to do with security. I will try to get your answer out. I can't tell you exactly who it is; but the "need to know" is a security part of the operation. I think that is what you are driving at; who do you talk to to breakthrough and find out why this "need to know" phase of it.

Mr. WEADOCK. Mr. Holaday, these complaints have come from small businesses who already have security clearance. Nevertheless, there is certain information that is available, Government-owned information, technical information, that they are not entitled to obtain for their future development or whatever research they may be pursuing owing to this need-to-know obstacle. Now, we would like to have this subject explained and it would seem to be that this

[4a] Armed Services Technical Information Agency.

is not in your area of responsibility. We would like to have an indication with whom we might take this up. This is a very pertinent question to a number of people who have written the chairman and other members of the committee.

Mr. HOLADAY. Well, I certainly am acquainted with the particular problem which you are raising here. People quite often go under the assumption that if they have a confidential clearance that this permits them to have all the confidential—or even if they have secret—to have all the secret information in the Department of Defense. This is not true. Most industrial classifications of confidential and secret only permit them to have information in their particular area in which they are qualified to work or have worked in the past. This has been quite a problem. I have encountered it in research work. People come in and talk to us. Sometimes they have a perfect right to complain and other times they do not. I have found people trying to use this, that they can't get their fingers on something because if they could get in and find all the facts, then they might tell the Government whether they were interested or not interested in doing the work. I usually find that those people that want to do the work can get in and get the facts and get going and are not the ones that come in and ask us to hand them something on a silver platter. This security part of our problem is difficult. I don't know how we are going to get all the answers. I have worked on this ever since I have been in the Department of Defense and I don't know how to get all the answers to it. Security has its advantages and it has many disadvantages. Certainly it slows up our ability to talk to each other and to transmit information to each other. But we must have security if we are going to retain certain of our secure information which we do not care to have published or given to the Russians. I don't believe there is really an easy answer to your question. I assume to get the proper answer to it, or have it thoroughly discussed here, we we would have to have the people from the security part of the Government to come in and talk to you.

Senator SMATHERS. Mr. Holaday, on that point, and I think on these other points that Counsel Weadock has been raising, I presume you would be agreeable to directing members of your staff to sit down and talk with the members of this Small Business Committee staff to see if we could not arrive at some common area and to set out some sort of ground rules which would help, in effect, the small-business man to get this information which they say they need to get and which they now cannot get. Obviously, I don't know too much about it at this moment and it is clear that you don't. If we could get these people together on this basis, you would be willing; would you not?

Mr. HOLADAY. Yes; I think my staff and the fellows that are in the military—in other words, to use all the staffs—I would be glad to do that; yes.

Senator SMATHERS. I think it is important. You say there are $5 billion to be spent this year. Next year, I don't know how much would be allocated to guided missiles. Do you have any idea how much you people will ask for? Will it be doubled or tripled?

Mr. HOLADAY. If the amount of money we have asked for on the supplemental 1959 and revised budget, I mean for 1959, this would come to about $6.4 billion.

Senator SMATHERS. It would be a steadily increasing amount?

Mr. HOLADAY. Yes, sir.

Senator SMATHERS. And thereby becomes a greater and greater concern to the small-business community that there will be avenues carved out for them.

Mr. HOLADAY. Yes, sir.

Senator SMATHERS. Over which they can proceed to approach this large sum of money and hope that they might get some of this business?

Mr. HOLADAY. Yes, sir.

Senator SMATHERS. All right, sir. Thank you very much, Mr. Holaday.

I am including in the record at this point the full text of the Department of Defense Directive to which Mr. Holaday referred.

(The directive follows:)

EXHIBIT 1

NOVEMBER 15, 1957.
No. 5105.10

DEPARTMENT OF DEFENSE DIRECTIVE

Subject: Director of Guided Missiles.

I. PURPOSE

The purpose of this directive is to provide for the authoritative direction of all activities in the field of guided missiles.

II. RESPONSIBILITY AND AUTHORITY

In accordance with provisions of subsection 202 (f) of the National Security Act of 1947, as amended, and section 5 of Reorganization Plan No. 6 of 1953, there is established the Office of Director of Guided Missiles. The Director of Guided Missiles will direct all activities in the Department of Defense relating to research, development, engineering, production, and procurement of guided missiles.

III. RELATIONSHIPS AND ORGANIZATION

A. The Director of Guided Missiles will report directly to the Secretary of Defense.

B. The Director of Guided Missiles will utilize existing staff organizations within the Office of the Secretary of Defense including appropriate staff members of the Assistant Secretaries of Defense for Research and Engineering, Properties and Installations, Supply and Logistics, Comptroller, and the military departments, insofar as they may be necessary to carry out his assigned functions.

C. The Director of Guided Missiles is authorized such personnel and staff support as may be required for the performance of his duties and as may be approved by the Secretary of Defense.

IV. REPORTS

A. The Director of Guided Missiles may require such information and reports from agencies of the Office of the Secretary of Defense and of the military departments as may be required for the performance of his duties.

B. The Director of Guided Missiles will make regular periodic reports to the Secretary of Defense and will be responsible for the preparation of such reports as may be required of the Department of Defense with regard to guided missiles by the President and the National Security Council.

V. SUPERSEDURE

All directives, instructions, and memorandums or parts thereof to the extent they are inconsistent with the provisions of this directive are modified accordingly or rescinded, as appropriate.

NEIL MCELROY, *Secretary of Defense.*

Mr. HOLADAY. Thank you.

Senator JAVITS. Mr. Chairman, before Mr. Holaday leaves, may I make one suggestion for the record? It strikes me, as I listened to what you said, that this is peculiarly a case where the staffs would have to be very well oriented as to what small business can do. If information can't flow to the small-business man because it is so highly classified, then information should flow from the small-business man to the procurement people. You people can do a great deal toward parceling out the business and picking the fellows that want to know rather than leaving it the other way. I think we would be completely frustrated if we expect you to divulge a lot of information to small-business men. I make that suggestion, Mr. Chairman.

Senator SMATHERS. Yes; thank you.

Senator JAVITS. I think it may help us.

Senator SMATHERS. The next witness will be Mr. Roy W. Johnson, Director, Advanced Research Projects Agency.

STATEMENT OF HON. ROY W. JOHNSON, DIRECTOR, ADVANCED RESEARCH PROJECTS AGENCY, DEPARTMENT OF DEFENSE

Mr. Chairman and members of the committee, I welcome the opportunity to appear before your committee to discuss the functions of the Advanced Research Projects Agency and to outline how ARPA will conduct its business, particularly as it concerns small business.

The Advanced Research Projects Agency was established on February 7, 1958. The Agency is responsible to the Secretary of Defense for the direction or performance of such advanced projects in the field of research and development as shall be designated by individual project or by category.

Although formed only recently, ARPA is already engaged in the active direction of several projects. One of these is the recently announced plan to fire several satellites and lunar probes in the coming months. In addition to these more glamorous items, it is a primary mission of ARPA to sponsor and direct advanced research programs without the necessity of their being justified by a specific military requirement. Only in this manner can the advanced frontiers of science be penetrated early enough to provide the basic building blocks for the major projects of tomorrow.

Obviously, the matter of prime interest to this committee is how ARPA plans to implement its programs. Initially, it is planned to rely heavily on existing facilities of the military departments and other Government agencies. These agencies, in turn, will utilize universities and industry, both large and small, in the accomplishment of assigned tasks. In the future, it is anticipated that direct contracts will be made with universities and industry for scientific and technical studies and management-type activities. In both present and future operations, every possible consideration will be given to the utilization of small business.

Both the Soviet Union and the United States have made initial strides into space. There are many more space barriers before us. Substantial benefits will accrue to the nation which first penetrates these barriers. While we may fail to be first in a few space projects, it is our firm belief that our present and future programs will be highly

successful and pave the way for the future military security of the free world.

Mr. Chairman, I am prepared to answer the questions of the committee.

Senator SMATHERS. Senator Thye, do you have any questions of Mr. Johnson?

Senator THYE. No; I do not, Mr. Chairman.

Senator SMATHERS. All right; Mr. Johnson, I would just like to ask you 1 or 2 questions. You say that in both present and future operations every possible consideration will be given to the utilization of small business. Could you be more specific in that "possible consideration"? Do you have any specific plans for implementing this "consideration" that you are going to give to small business?

Mr. JOHNSON. Well, we have, I think, a management plan that tends to give a wider distribution of contracts. We are now recruiting in the Department of Defense a group of scientists we think will grow to probably some 25, half of whom will have doctors' degrees. This group will study the areas that need further scientific development. I think we should be able then to give out more prime contracts in larger numbers, smaller dollar amounts, by so doing, we would, for example, if decided, deal with one large prime contractor in the whole area of research phenomena, as applied to defense against the ballistic missile, which is one of our projects. We considered this method of dealing with one large prime contractor, and decided to go this other route although it will take a little longer. You might be interested to know that, right today, we are going to assign two $100,000 contracts; one to Stanford Research Institute, and this will be administrated by the Office of Naval Research. I would hope that, in so doing, we could have many $100,000 or $50,000 research contracts as opposed to a big $5 million or $6 million one that was then farmed out. We don't know yet. It is too early to find out whether this is the right approach.

Senator SMATHERS. Well, it is clear, from the nature of your testimony and the job which you have, that there is no direct relationship, may we say, between your particular position and the small-business community and the securement of contracts by them. But I think we can be encouraged. There seems to be evident, in your testimony, some awareness of the importance of the small-business community, and the need for their getting, wherever practical and wherever possible, a part in these programs. As long as you gentlemen who are the heads of these important agencies have that awareness, why, we feel that small business will be properly looked after. Certainly, we hope so.

Do you have any questions.

Mr. WEADOCK. Yes, sir, Mr. Chairman.

Mr. Johnson, you indicated that in the future there will be a time when your Agency will effect direct contracts with universities and industry. Can you say how early or how late that might be?

Mr. JOHNSON. Since this testimony was written, as I said, which was several days ago, we decided today to issue a $100,000 contract to Stanford Research Institute, which is a part of Stanford University. So we are already following that procedure. We are not going to set up an administrative office in my group to administer these contracts. We assign them to an administrative command in one of the military

services to work for us, to follow the contract, to do the reporting, but it will be our money. We will give it technical guidance.

Mr. WEADOCK. You perceive this will be the procedure to be followed from here on in?

Mr. JOHNSON. Yes; I do. As a matter of fact, the contract orders we issued on one of the lunar projects, General Schriever, head of the Ballistic Missile Command in California, brought in Ramo-Woolridge, who play a very important role, and then subcontract out from there.

Mr. WEADOCK. The Bureau of the Budget has asked for $480 million for your Agency for next year, as we understand it. For all of this, with the exception of, perhaps, the payroll, I presume, you anticipate delegating your contracting authority to 1 of the 3 military services. They will effect the contracts; they will administer the contracts, and the end item will belong to you; is that about the nature of it?

Mr. JOHNSON. No; that is not quite correct. A large part of the work we will specify the end contractor. For example, take the case I am talking about this morning, we received a proposal. We reviewed it technically. We are now going to tell the Navy, for and on our behalf, to supervise the contract which will be placed out at Stanford Research Institute.

Mr. WEADOCK. Can any analogy be drawn between what your people will do and let's say the technical people of the Air Force who evaluate a proposal and then say this looks right to us, so they tell their purchasing people to make a contract—and so in your case you go ahead and give them the funds? Is that more or less the nature of the review your people would do?

Mr. JOHNSON. No, sir; what we are trying to do here is to prevent building in the Pentagon another administrative agency that is going to do a contracting job. We do have the authority to do that. As a matter of fact, we have the authority to create our own laboratories. We decided, however, that we don't want to build another agency. We are going to hold the people on our staff to probably not more than 20, augmented by another 25 scientists. We will then use contracting administrative facilities that presently exist in other governmental agencies to do the job for us under contract with us.

Mr. WEADOCK. I thought that is what I said.

Mr. JOHNSON. I am sorry. I misunderstood. I thought the case you were referring to was if we have a technical group acting in an advising capacity, they don't administer the funds.

Mr. WEADOCK. No; I mean your technical people are the ones who know what you want.

Mr. JOHNSON. That is right.

Mr. WEADOCK. And they are the ones who can judge who can best give you what you want, are they not?

Mr. JOHNSON. That is right.

Mr. WEADOCK. Mr. Johnson, in recent days you, I am sure, have been conferring with Dr. Dryden concerning the hearings to be held by Senator Johnson a week from today on the President's proposal.

Mr. JOHNSON. That is right.

Mr. WEADOCK. Going back to the Bureau of the Budget again, we understand that $100 million would go to the National Advisory Committee for Aeronautics, and, as I understand it $480 million will

remain with your group. With your intimate knowledge of the subject, do you feel this is what this thing is going to result in; the bulk of your funds will remain with the military and only a fraction will go to the NASA (National Astronautics and Space Agency)?

Mr. JOHNSON. The total is $520 million, of which approximately $360 million is for space.

Mr. WEADOCK. Yes, sir.

Mr. JOHNSON. In our proposed budget of the $360 million, we have so far in our own thinking allocated $72 million as being primarily civilian-science oriented. The remainder, which would be $290 million, roughly, we think is all military, direct military. A very important piece of that is reconnaissance satellites.

Mr. WEADOCK. We are interested in the money, Mr. Johnson, quite candidly. We want to know where it is going to go because, we want to know what we might advise small business, this committee advising small business what they should do. Mr. Wendell Barnes is going to testify here, following yourself, and, perhaps, if we could get an indication that the National Advisory Committee for Aeronautics or the National Astronautics and Space Agency is going to have quite a considerable amount of funding, it might be well to have Mr. Barnes consider the possiblity of starting a small-business program there. If you anticipate continuing your contracting activity through the military services, as far as ARPA is concerned, we feel that there already are established safeguards in the military services to, let say, look after the small-business man, in a manner of speaking. What would be helpful would be to try to get an indication, if we could, from you because of your, I'm sure, intimate relationship with Dr. Dryden,[4b] of what we can look for there under the President's proposal to see if, perhaps, we ought to suggest to Mr. Barnes that this program be developed. Now, of your own knowledge, Mr. Johnson, do you have any awareness of what is proposed monetarily over there at NACA?

Mr. JOHNSON. No; I do not know what budget the NACA is preparing. I can only speak of the amount that is now in our budget which I think would be transferred to the new Agency when that Agency is created. It would be less than the $100 million. I would suspect, however, if I were in Dr. Dryden's spot, in the first year of an all-out civilian program, he might have a need for more than that.

Senator THYE. Mr. Chairman, there comes a question to my mind at about this point in the discussion, and that is, Mr. Johnson, are you going to concern yourself with any of the physical equipment and the tools that might be required in the new field of advanced research, or are you just going to concern yourself with the policy question?

Mr. JOHNSON. Oh, no, sir. We are an agency with money and, obviously, we have got to concern ourselves with the wise expenditure of that money. Therefore, we have a responsibility to not only select the contractors but to administer the work and, in some cases, if I understand your question correctly, there may have to be some facilities.

Senator THYE. That is what I was getting at.

Mr. JOHNSON. That is correct.

Senator THYE. In other words, I wondered whether you would, as an agency of the Government, have some of the responsibility of the

[4b] Dr. Hugh L. Dryden, Director, National Advisory Committee for Aeronautics.

tools or the dies or the planning and development of the kind of equipment that would be used in shaping whatever the research-project material might be. You are entirely in a new field, and I just wondered whether you would develop some of the necessary tools or whether you would leave that to industry itself.

Mr. JOHNSON. We do not intend to establish any of our own laboratories. We intend to use the Government laboratories where they exist, and we intend to use laboratories that now exist in industry and universities. It may well be, to complete some of the programs that we are planning, that we will have to be the parties to contracting for more real estate or construction of some special facilities.

Senator THYE. The reason for the question, Mr. Johnson, is primarily this: That, if you let it to a prime contractor and he commenced within his own division to set up the subsidiaries within that division to do specifics in whether it was a gadget for a motor or whether it was a shell casing—or when I say a "shell" the missile shell—I am thinking entirely in terms of whether this one prime contractor would commence to develop within his own organization or would he go out to an established organization that has its mechanics and its proof and ability to assist in developing the gadget that would become a part of the missile motor or a part of the missile construction itself, that you would need in development of both the missile and the outer space—whatever it might be determined—whether it be a satellite or whether it be a sphere of its own. I am thinking now of how did we safeguard Mr. X out in Ohio that has a crew of skilled workers, that had been engaged in airplane component-part construction but, because you are opening and entering into a new field, how does he become a part of the development in this new field? That is my concern so far as it relates to the small-business man.

Mr. JOHNSON. Mr. Senator, I think I can answer it this way. The very nature of our work—we are called the Advanced Research Projects Agency—implies that under only very unusual circumstances would we be procuring anything that was repetitive in production. Two of a kind would be very seldom procured by us. At the moment a program reached the point where it was no longer in the research area but became a development project, it would be assigned then to a military agency. We would learn quickly to withdraw at the right time.

Senator THYE. Then, if I may interrupt at that point, Mr. Johnson, a military agency, not for the purpose of the construction but only for the purpose of the allocation or the acceptance of bids on that particular project, the military agency would be only the agency that would administer it, not the construction of it?

Mr. JOHNSON. Well let me back up a little bit. Let's take an example. If we can now research a defense against the ballistic missile by studying the things that need to be studied in pure research and come up with a new defense system, at the time that system was ready to go into development to be produced, the hardware produced, we would get out of the act. ARPA would no longer concern itself. It would then be assigned by the Secretary of Defense to 1 of the 3 military services to finish the development and go into procurement. It would no longer be ARPA's responsibility. Therefore, I think the nature of ARPA's research work is such that no contractor would be wise to build a facility for our work. He would be wise to use the

facilities that exist, because it wouldn't be permanent work; it would be mainly in the area of research and, maybe, building a prototype. Therefore, I could not guess that a contractor would build a facility for our work. Now, on the other hand, we may have to, to be specific, buy a little land in Hawaii to build a tracking station to track some satellites. That would be a Government facility. We would be in in the procurement of real estate. That sort of real estate will have to go along but very little, little of the kind you are referring to in industry.

Senator THYE. But the instrument to track would also already be in existence?

Mr. JOHNSON. That is correct.

Senator THYE. It would only be a location.

Mr. JOHNSON. That is correct.

Senator THYE. But I am thinking more about the development of the instrument, because you are in a new field and you are not certain just what type of a missile will be needed or what you will ultimately perfect in the missile, and the motor type that will be the driving force.

Mr. JOHNSON. In the missile field——

Senator THYE (interposing). All the gadgets that go into that—I was just wondering whether you would have a plan that would afford the small-business man the opportunity of doing a part of the construction of the gadgets that go into the assembly, once you have developed and decided on a certain type of construction?

Mr. JOHNSON. Small business is ideally suited for many of the instruments that we are now building, that go into the payload of our satellites, that go into tracking equipment. They are one of a kind. They are handmade, very specialized in character. I think that the smaller laboratories are ideally suited for that kind of work. The large manufacturer is interested primarily in the thing that he can make over and over again. He is more efficient if he has a contract to make a thousand of something or a million. The smaller-business man, I think is more competent to make one of a kind. This is an overgeneralization, I know, but I would suspect, because of the nature of our work we would be using on a dollar basis small industry to a greater degree than some other Government agencies.

Senator THYE. Those are all the questions I have.

Senator SMATHERS. All right, sir, thank you very much, Mr. Johnson.

Our next witness is Mr. Wendell Barnes, Administrator, Small Business Administration.

STATEMENT OF HON. WENDELL B. BARNES, ADMINISTRATOR, SMALL BUSINESS ADMINISTRATION

Mr. BARNES. Good morning Mr. Chairman and gentlemen of the committee.

Senator SMATHERS. It is nice to have you here. You may proceed at your pleasure.

Mr. BARNES. When I appeared before the full committee last month, I mentioned that the Small Business Administration had taken steps to provide counsel and aid to small firms seeking Government contract opportunities in connection with the missile program. The high degree of interest small business has in this program is

obvious when it is noted that it has been estimated that the various Government departments may expend approximately $4 billion in the present fiscal year on the missile program. In view of the wide variety of requirements pertaining to missile procurement and the technical knowledge and facilities needed to perform missile contracts, this agency is receiving numerous requests from small companies on how small business can participate.

Subcontracting is the principal, but not the only approach available to small businesses which want to participate in the missile program, due primarily to the practice of utilizing the "weapons-system concept" of procurement for the research, development, and production of missiles. The Department of Defense has felt that the procurement of missiles can best be accomplished through this system of procurement.

There is a tendency to believe that the development and production of the major missile components and segments of the missile system are beyond the capacity of small firms. This is not true. This committee, officials of the Department of Defense, and all contracting officers should bear in mind that many small companies are doing an excellent job in the field of developing and manufacturing major missile components and handling equipment. There are many other small firms that would do an equally good job if given an opportunity.

This committee will be interested in some examples of small firms whose performances in this field have been outstanding. One firm is the Cooper Development Corp., of California, which employs about 160 people, 65 of whom are graduate engineers. This company developed and is manufacturing the Wasp and the Asp. These rockets are used for upper atmospheric research, and were developed and are being manufactured under complete systems contracts with the Navy. It is also of interest to note that this company developed and built the motor cases for the Vanguard, and is working on components of the Jupiter C, which is used to launch the Army's Explorer.

I might interpolate here that I am informed the casing of the missile which launched the Army's satellite now circling the globe, was manufactured by this company.

Another interesting accomplishment of a small firm in the missile field is that of the Spencer-Safford Loadercraft Co., of Kansas. This company was asked to develop means for transporting rockets. They developed a large trailer and a hermetically sealed can and are manufacturing both. The missile completely assembled is placed in the can and air is pumped out and replaced with inert gas. The can then is placed on their specially designed trailer and delivered to its destination ready for firing. The trailer is so designed that upon reaching an underpass with insufficient headroom it will tilt the load to permit passage and right itself again after negotiating the underpass.

Other examples of small companies which have participated as missile subcontractors are the Western Way Welding Corp., of Los Angeles, which has produced missile hardware; the Santa Barbara Research Corp., which since has been bought by Hughes Aircraft Co.; and the Raymond Rosen Corp., of Pennsylvania, which worked on electronic parts.

I cite these as outstanding examples of small-business capabilities in this field. There are, I am sure, many others.

I would like to interpolate at this point by saying that the Small Business Administration has been working for some months to compile a list of companies which we consider qualified for research and development work in the various technical fields. I submit this list as an exhibit.[5] I do not ask that the committee publish it, but I submit it for your information.

Senator SMATHERS. We will not print it, but we will have it for reference.

Mr. BARNES. I would like to add that we are just completing work on this particular list and are identifying the specific fields in which these companies have exceptional qualifications. Of course, I do not say every firm on this list can do any type of highly technical work but together they have many capabilities and are worthy of being examined by the various procurement offices. We intend to make this list available to every agency and every department engaged in classified or unclassified research and development work in the hope that this will do what was suggested a few minutes ago—make procurement officers aware and have information upon which they can act to bring small firms increasingly into research and development fields.

The Small Business Administration's programs for helping small concerns to participate in a fair share of Government missile procurements will result in (1) prime contracts set aside for exclusive bidding and performance by small-business concerns, and (2) increased information on subcontracting opportunities for small businesses.

An important element in our efforts to assist small business is the very excellent cooperation received from Mr. Perkins McGuire, Assistant Secretary of Defense (Supply and Logistics), and his Director for Small Business Policy, Mr. Andrew W. Duncan.

Joint set-asides are being initiated whenever feasible in the procurement of missile parts, subassemblies, and assemblies for which procurement responsibility is retained by the Government missile-procuring agency, and for which adequate working drawings and specifications are available. The Small Business Administration has recently established a full-time representative at Redstone Arsenal and part-time representatives are assigned to other installations at which missile procurement set-asides are being made.

The total value of set-asides identified with the missile program cannot be fully determined at this time because some of the set-asides on components or other types of items not directly a part of missile research and development or production have been accounted for under the specific category or item concerned. Thirty set-asides amounting to 3½ million have been made during this fiscal year, which are definitely identified with the missiles program.

At this point it may be of interest to this committee to review the record of all set-asides made during the past 3 fiscal years, and to compare those made during the first 9 months of fiscal year 1958 with the same period in fiscal year 1957.

The following table lists the dollar amounts of these set-asides:

[5] Retained in committee files.

EXHIBIT 2

Dollar value of set-asides made by SBA with Government agencies

Fiscal year 1955	$386, 610, 589
Fiscal year 1956	497, 678, 432
Fiscal year 1957	744, 335, 298
July 1956–March 1957	506, 800, 270
July 1957–March 1958	640, 627, 632

The increase in set-asides as shown by the above table is, of course, the result of the very excellent cooperation of the procuring agencies of the Government with the Small Business Administration.

As this committee is aware, the Small Business Administration has no authority to make small-business set-asides with Government prime contractors. All we can do is use persuasion and in this we are limited by the number of employees who can be assigned to work with prime contractors.

Subcontracting offers a greater field for small-business participation in the missile program. A number of small-business concerns are now active in such work in the missile field. SBA has adapted its subcontracting program and has implemented new procedures to match the technical requirements of the missile program with the technical capabilities of small concerns that wish to participate it it. In doing this, we have developed considerable information not readily available elsewhere. This information makes it possible to extend technical and financial aid to small firms engaging in missile work. It also permits counseling of these small firms effectively on the technical requirements of specific production of missiles and their components.

In order to give intelligent and valuable counsel, SBA has to know what fields of interest in research and development are available for subcontracting to small business and by what major contractors or subcontractors. SBA has to know what components, assemblies, subassemblies, and parts are available for subcontracting to small business; also what special tooling, machine tools, production, and test equipment will be furnished to small business by the Government or by the major subcontractors.

SBA will be continually developing factual information which will be incorporated into the revised subcontracting program and used for counseling purposes. The agency, with the cooperation of the Department of Defense, the military services, contractors, and related sources, has accumulated and prepared a Missile Directory, which contains a listing of missiles procured by the Army, Navy, and Air Force; the names and addresses of the prime contractors and large major subcontractors; a listing of the components, assemblies, subassemblies, and parts required in the production of missiles and supporting equipment.

I will now offer this directory as exhibit B with the same understanding that it is not offered for publication but for the uses of the committee, since this will be printed and be available for distribution in the near future.[6]

Senator SMATHERS. We will make it a part of the record by reference.

Mr. BARNES. An additional fund of basic data and related material has been obtained from SBA field offices and is now being collated in

[6] Retained in committee files.

the Washington office. Our regional directors or their representatives have visited many of the missile prime contractors and major subcontractors, to ascertain their requirements. Although the facts received thus far are up to date and very comprehensive, more facts must still be obtained.

It might be interesting to the committee to know the types of information we are developing by personal calls on the major prime contractors and subcontractors in the missile field. This is the information that we have obtained and are still in the process of locating. Each contractor has been asked by personal interview, asked at least the following questions and perhaps more:

1. Under the prime contract which you have with the Government, is the approval of the contracting officer required on subcontractors?
2. What subsystems or components will the prime contractor produce itself? What subsystems or components have been or will be subcontracted by the prime contractor? To what companies or subsystems or components have you subcontracted, giving the address and place at which the subcontracts are being performed.
3. What part or parts, if any, of the missile and its supporting equipment have been reserved from the prime contractor for or has been or will be subcontracted to any military installation for procurement or production? If any, what parts or to what military installation.
4. What special tooling, test equipment, machine tools, and production equipment, if any, will be furnished by the Government or by the prime contractor to the subsystem or component contractors?
5. What, if any, research and development work will be subcontracted by the prime contractor and in what specific field or fields? What, if any, research and development work is the responsibility of the subsystem or component subcontractor, and in what fields?

I read these into the record to give the committee an idea how complex it is to assemble this type of information when it is necessary, as it is under the weapons system of contracting, to go to the prime contractor himself. It is the only way the information can be collected accurately, and it is a large job to collate it. But, as indicated, we now have the first directory and this will be added to from time to time.

When all of the essential elements are taken into account, we feel confident that SBA has initiated a realistic undertaking which will assist and benefit small business.

In implementing its subcontracting program, SBA is keeping its field offices supplied with full information as received and collated in the Washington office. SBA's field offices have been instructed to check their respective industrial facilities inventories—which as the committee is aware, the list of small companies that have voluntarily listed themselves with us and each of our field offices—and to request all small-business firms that registered prior to July 1, 1957, to bring their data up to date. The revised subcontracting program will be kept current so as to be of continuing usefulness to SBA's field representatives in counseling with small business.

Heretofore, there has been some question as to the extent of control the Government had over the subcontractors of its primes. Recent decisions of the Comptroller General give the Government more authority and are important to us because they permit us to offer additional assistance in the subcontracting field.

The Comptroller General in two recent decisions, 37 Comptroller General 169, dated September 17, 1957, and Decision No. B–131078, dated February 26, 1958, indicated that procurement agencies may

restrict the right of Government prime contractors to subcontract portions of the work to subcontractors of their own choosing. By these rulings, procurement agencies may insert in contracts a requirement that the prime contractor withhold awarding a subcontract until written approval has been obtained from the Government contracting officer of the employment of the particular subcontractor—

which approval is to be based upon a showing that the subcontractor is competent, responsible, and technically qualified to perform the work properly.

In his decision of February 26, 1958, the Comptroller General indicated that the Government contracting officer should apply the same standards to ascertain the fitness of the subcontractor as he applied to determining the fitness of the prime contractor.

Congress has established a method whereby an independent and unbiased determination can be made of a small-business concern's technical and financial competence to perform a specific Government contract. I refer to the certificate-of-competency procedure authorized by sections 212 (d) and 213 (a) of the Small Business Act of 1953. As the Comptroller General has declared the same standards of technical competency are to apply to both prime contractors and subcontractors whenever the Government reserves the right to pass upon the latters' ability, I believe the use of the certificate-of-competency procedure is proper whenever the technical competence of a small-business concern to perform a subcontract is challenged by a Government contracting officer.

Senator THYE. Mr. Chairman, I wonder if Mr. Barnes would mind a question at this point. The question is, Mr. Barnes, Have you had any small-business firms contact you in your agency for direct help? Have you had many make direct contact with you for help in obtaining subcontracts?

Mr. BARNES. Under the missile program?

Senator THYE. Yes.

Mr. BARNES. Yes, sir; in many parts of the country.

Senator THYE. Would you have knowledge of how many you were able to assist in obtaining a contract.

Mr. BARNES. I don't think it would be in that form. We list our inquiries and break them down under whether they are inquiries about financial assistance or production assistance or procurement assistance, and I rather doubt if the inquiries are broken down as to whether they are in the missile field or for other Government contracting assistance.

Senator THYE. You are not certain whether it is an existing business like the airplane or some of the other defense activities, or whether it is a new contract under the new development program of the missiles?

Mr. BARNES. No. We would have, I think, no way of breaking it down and, furthermore, in most instances all that is possible for us to do is to identify what type of business the firm is interested in and is apparently qualified to perform, and then make a referral of that firm to the prime contractors or subcontractors in the missile field. We may not hear what eventually happened to them after they went to the prime contractor to solicit a subcontract. It is information that we are furnishing—not the contract itself, so it would not be helpful, I think, to have anything more than just the number of inquiries. We have identified those and there have been many of

them on missile work, research and development, as well as general contracting.

Senator THYE. Thank you.

Mr. BARNES. Accordingly, we propose to explore with the various procurement agencies, particularly the Department of Defense, the establishment of an expeditious and efficient procedure whereby, whenever a contracting officer refuses to approve a small-business concern as a subcontractor, pursuant to a provision in a prime contract requiring the contracting officer's approval of subcontractors, our agency can investigate and certify concerning the technical competency of the small-business firm.

I wish to point out that this procedure will not impinge in the slightest on the prime contractor's right to select his own subcontractors as the issue can arise only, and I emphasize these words, the issue can arise only when the prime contractor has decided who his subcontractor is to be and the Government's contracting officer chooses to veto such selection. If anything, this proposed procedure will support the right of the prime contractor to choose his own subcontractors as it will result in tempering the power of the Government contracting officer arbitrarily to interfere with the prime contractor's selection.

The importance of this proposal cannot be overemphasized. If we observe the declining share of Government prime contracts being awarded to small business, the broadened use of the weapon-system concept and the increasing complexity of the items being procured by the Government, it becomes clear that greater participation in subcontracting is essential to the continued growth of small business. The proposal based on the General Accounting Office decisions will help insure against unwarranted rejections by Government officials of small-business concerns selected solely by the prime contractor to be their subcontractors.

Certainly, one point bears repetition—the requirements of the missiles program change rapidly. Some missiles are "phased out" while improved successors are "phased in." From time to time, additional missiles reach production status. New launching platforms and handling equipment will be constructed, old ones modified. Additional plants located outside the principal industrial area will be devoted to missile production by subsystem and large major subcontractors. Regular liaison by SBA field representatives with a large number of major subcontractors—and with an additional large number of field office personnel of the Army, Navy, and Air Force—will have to be maintained.

SBA is not unmindful of the fact that in carrying out its revised subcontracting program, it can and will be of very considerable assistance to those major missile subcontractors establishing new production facilities outside of principal industrial areas. To this end, SBA can and will help them by developing additional sources of qualified small-business subcontractors.

I will be happy to attempt to answer any questions.

Senator SMATHERS. Senator Thye, do you have any questions.

Senator THYE. No; I have no further questions, Mr. Chairman.

Senator SMATHERS. Thank you, Mr. Barnes. It is a very helpful, comprehensive and encouraging statement, and we are grateful to you for it. Thank you, sir.

Our next witness is Mr. Fredrick Lack, vice president, Western Electric Co., Inc.

STATEMENT OF F. R. LACK, VICE PRESIDENT, WESTERN ELECTRIC CO., INC., NEW YORK, N. Y.

Mr. LACK. Mr. Chairman, in response to your letter we have a prepared statement which, with your permission, I would like to read.

Senator SMATHERS. Go right ahead, sir.

Mr. LACK. Mr. Chairman and members of the committee, in response to your invitation to Mr. Goetze, our president, I have been asked to give you the information you requested concerning Western Electric's subcontracting program on our Government contracts. I have been responsible for the bulk of Western's business activities for the Government since 1938 and am currently in charge of this work.

We appreciate the distinction accorded as the first representative of industry to appear before you and report on this very important program which engages this committee's attention.

It is Western's practice, in general, to manufacture only those items which cannot be purchased satisfactorily. The majority of our suppliers are small concerns; in fact our traditional company policy in regard to the use of small business is one which I think you would recognize conforms to your own basic objectives.

In 1955, in order to formalize this program on our defense work and also comply with a request of the Department of Defense, we designated an executive of the company as Western Electric small-business liaison representative. At the same time, we promulgated a formal statement of policy which, after designating the comptroller of purchasing division as the company's representative, went on to appoint the purchasing agents of Hawthorne, Ill., Kearny, N. J., Point Breeze, Md., Winston-Salem, N. C., Indianapolis, Ind., Merrimack Valley, Mass., Allentown, Pa., Laureldale, Pa., Tonawanda, N. Y., and San Francisco, Calif., as local small-business liaison representatives. It then gave directions to the local buying personnel as follows:

> When making purchases of materials and services to be applied against contracts or purchase orders received from the Army, Navy, or Air Force, the local buying personnel shall keep in mind the requirement for placing purchases with small concerns when consistent with good business practices. Where the buying considerations with respect to two or more potential suppliers are equal, the business shall be placed with the "small" supplier.
>
> Buying personnel shall include the following clause in all fixed price contracts and purchase orders valued in excess of $5,000 when the materials or services being purchased are for Department of Defense end use:
>
> You agree to accomplish the maximum amount of subcontracting to small-business concerns that you find to be consistent with the efficient performance of this contract or purchase order.

The request for information which you made of us was pointed particularly toward the fields of missiles, rockets, and outer-space explorations. In Western we apply the same broad policy to all of our Government business which, of course, encompasses the area you are concerned with. We keep our records on an overall Government business basis and would like so to report. Inasmuch as our missile business represents 70 percent of the total Government business, we believe that the statements we make can be applied to the specific areas with which you are now concerned.

Our Government business is carried on by two divisions of Western each with its own purchasing center. In addition, research and development for all Government projects is carried on by the Bell Telephone Laboratories, who also subcontract development, engineering services, and model work. For the purpose of this report we are submitting consolidated statistics.

The very nature of the missiles and their associated ground equipment requires that a relatively large dollar volume of the subcontracts be awarded to large companies. This is necessary because of the unique nature and magnitude of facilities and working capital required to produce this gear as well as the number of specialized engineering and technical skills necessary to handle the development and production effort in this new field of technology. Our work on the DEW line and White Alice also called for large dollar volume construction contracts.

However, outside of these special areas, we find that our Government operations lend themselves to the utilization of small business. Most of our orders are for small quantities of systems. Ordinarily, a contract involving 100 systems is a sizable order. This means that if a part is used 1 per system, we only need 100 parts plus a few for spares; likewise, if a part is used 2, 3, or 4 per system, the total requirement is still small when consideration is given to economy of volume production. This type of procurement is ideally suited to the facilities normally available in the small-business concerns. For this reason, the extent of our procurement from small business is indeed substantial. During the year 1957 approximately 78 percent of the companies on which our orders were placed were small-business concerns.

In 1955, to supplement our small-business liaison representatives, we also established supplier-relations offices. These are designed to encourage small-business participation in our program. The function of these offices is to receive a supplier's representative calling for the first time and discuss with him the type of products or services being sold. If we find the supplier's services can be used, he is introduced to the cognizant buyer and, if indicated, conferences are arranged with the engineering, plant, and maintenance representatives to discuss appropriate products and methods.

Prior to introducing the supplier's representative to the buyer, we discuss with him some of our purchasing policies and practices, and make available copies of our pamphlets, General Manufacturing Information for Subcontractors and Quality Information for Subcontractors. Copies are available for the committee if desired.

Many times we have arranged for a supplier to put on demonstrations for our project engineers. This practice has proved beneficial to the small-business supplier in that he is able to keep our people abreast of new developments or new designs of equipment, methods, and processes which may enhance his potential for additional business.

Statistical records are maintained in the supplier-relations office, including (1) correspondence with the supplier, (2) items or commodities in which he is interested, (3) information relative to the first order placed on him, if any, and (4) whether or not his firm represents large or small business.

In addition to our supplier-relations-office activity, we have participated in several exhibits and conferences that were conducted by

Government agencies and designed to promote utilization of small-business concerns in the defense program. We have set up displays at some of these meetings and have also arranged for vendors to meet with our engineering and operating people to discuss and demonstrate their products and capabilities.

In summary, we believe that Western's actual practices have been completely compatible with your policy of extending to small business equitable opportunity to participate in the performance of contracts for defense materiel.

Mr. LACK. Now, you asked specific questions A to J. Would you like me to read the answers to those questions?

Senator SMATHERS. No, sir; we will make that a part of the record in full. (See exhibit 3, p. 36.)

Mr. LACK. O. K. Now, as a part of the answer to question under "B." I have here 2 IBM tabulations listing the names of more than 6,000 suppliers, divided between the large and small, and the amount of payment made to each during the years 1956 and 1957. I can make that available to the committee.[7]

Senator SMATHERS. Senator Thye, do you have any questions?

Senator THYE. I was just looking at this exhibit that is listed as B. (See pp. 36-37.)

Mr. LACK. Yes, sir.

Senator THYE. And I notice the large suppliers number 1,292. This is the year 1956, and you have 21.1 percent, and then, going down through the years, it gives us a good report on the numbers and the moneys involved.

Mr. LACK. I call you attention, sir, to page 2, in which we eliminate some of the big construction contracts and that one big missile contract with Douglas. (See p. 37.)

Senator THYE. Yes; I am over on page 2 now.

Mr. LACK. Yes, sir.

Senator THYE. We just hope that you aggressively continue the efforts in behalf of the small-business man, because he is hard pressed where so much of his tax dollars go back into the Treasury to become a part of the defense appropriations and expenditures. I thank you, Mr. Chairman.

Senators SMATHERS. Counsel Weadock, do you have any questions?

Mr. WEADOCK. Mr. Lack, in your exhibit C (see p. 38), the Government requires no special provision for contract-dispute arrangements. The only thing you do is utilize a regular commercial clause?

Mr. LACK. That is right, except in the case of a few contracts where the Bell Laboratories have used the standard disputes clause in their subcontract. That isn't mandatory, as I understand it. We try to use the usual commercial methods of settling disputes.

Mr. WEADOCK. You find that quite favorable?

Mr. LACK. As I said here, I don't think we have ever had any lawsuits, and we have had very little trouble; that doesn't mean that everybody is satisfied with us or we with them, but, with the great number involved, you are bound to get a few that——

Mr. WEADOCK (interposing). Well, actually, as a practical matter, we have had no complaints on your company, specifically.

Mr. LACK. That is fine; I am glad to hear that.

[7] Retained in committee files.

Mr. WEADOCK. I was just curious to know if you had any difficulty, yourself.

Mr. LACK. No, sir.

Mr. WEADOCK. On your exhibit D (see p. 35), indicating the cost or, rather, the profit rate that Western affixes to items that are supplied them by subcontractors, you indicate that to justify the 3- to 10-percent profit which you attach to these items that are subcontracted, one of the services that Western would perform would be in the nature of financing. Now, have you on occasion financed subcontractors to purchase materials or something? Is that what is meant by that statement?

Mr. LACK. Yes; we have. Not in any great extent, however. But there have been times when we have advanced money to subcontractors.

Mr. WEADOCK. How would one of those costs be an item of purchasing? You mean just your administrative purchasing costs?

Mr. LACK. That is right.

Mr. WEADOCK. Of acquiring what they are giving——

Mr. LACK (interposing). Well, the purchasing department requires skilled people, skilled buyers who know their field, and the placing of these subcontracts takes a certain amount of time and effort, and that is one of the costs of doing subcontracting.

Mr. WEADOCK. Why is there such a wide variation, Mr. Lack?

Mr. LACK. Oh, no. Wait a minute; you are talking about from 3 to 10. That is profit.

Mr. WEADOCK. That is the profit you affix on top of the item that you subcontracted.

Mr. LACK. That is right.

Mr. WEADOCK. That is Western's profit.

Mr. LACK. That is Western's profit.

Mr. WEADOCK. Now, why the wide spread?

Mr. LACK. The wide spread is this: You can't justify charging a high profit on an item; for example, you might have made and shipped directly to the Army or the Navy installation. On the other hand, when you buy a piece of equipment or subcomponent that you build into the end item in your own shop, then you take the same profit on it as you do if you made it yourself.

Mr. WEADOCK. Well now, in addition to that profit that you have affixed to the item that you have taken into your own shop and introduced into another system, then you additionally have your own profit factor involved in your basic contract, do you not, sir?

Mr. LACK. No; the question asked the profit rate affixed to items furnished by our subcontractors.

Mr. WEADOCK. That is right.

Mr. LACK. Now, that is the profit, and there is nothing else on top of that.

Mr. WEADOCK. There is no second tier of profit.

Mr. LACK. No.

Mr. WEADOCK. In other words, your both tiers of profit in all cases, as far as Western Electric is concerned with Government contracts, would not exceed 10 percent; is that a true statement?

Mr. LACK. That is right. For example, I would buy this item; it becomes now the cap of a missile. Its cost to me is $10 and, in making

up the price of the final item, this goes in at $10 plus a $1 profit and that is it.

Mr. WEADOCK. All right, sir. Fine.

Senator THYE. Well, I note here on item D——(p. 38)

Mr. LACK. (interposing). Yes.

Senator THYE (reading):

In 1957, our overall profit on our Government business was 3.2 percent net after taxes.

Mr. LACK. That is right.

Senator THYE. That would be everything?

Mr. LACK. Everything.

Senator THYE. Subleasing and all?

Mr. LACK. Yes.

Senator SMATHERS. Thank you very much, Mr. Lack.

Mr. LACK. Thank you.

Senator SMATHERS. We will include in the record at this point the exhibits submitted by Mr. Lack, to which he referred in his statement.

(The exhibits are as follows:)

EXHIBIT 3

INFORMATION SUPPLIED BY MR. F. R. LACK, VICE PRESIDENT, WESTERN ELECTRIC CO., INC., AT THE REQUEST OF SENATOR SMATHERS

On the following pages there appears the information about our business which was specifically requested in Senator Smathers' letter of April 11, 1958.

Statistics regarding standard Bell System products sold to the Government have been eliminated, mainly because of the relatively small volume of this business and, further, because it is my understanding that you are interested principally in items of special Government design.

The statistical data is presented on a calendar-year instead of a fiscal-year basis to follow our standard accounting procedures, and the material for subcontracts in paragraph B is on the basis of payments to suppliers rather than values of subcontracts placed. This method of reporting was submitted to Mr. Weadock, who gave his approval.

A. "The total dollar value of both prime contracts and first-tier subcontracts received by your firm from the military and other prime contractors for both missile, and related item, research and development and production contracts during fiscal years 1956 and 1957, and up to date."

There is shown below a tabulation, by years, of the dollar value of military contracts received by Western:

	Million
1956	$465.6
1957	520.6
3 months, 1958	190.0

These figures include both research and development and production work.

Of the amount shown for 1956, approximately 52 percent involved missiles and related items In 1957, the percentage figure rose to 70 percent, and, for the first 3 months of 1958, 80 percent.

B. "During fiscal year 1957, and up to date, the names of the companies subcontracted to, the dollar value of the subcontracts they received from your firm, their affiliation with your firm, if any, and whether each of the subcontractors has historically been one of your suppliers of commercial items."

I have here 2 sets of IBM tabulations, listing the names of more than 6,000 suppliers (none of whom are our affiliates), divided between large and small, and the amount of payments made to each during the years 1956 and 1957.

Of all the suppliers used, approximately 50 percent were developed for our military programs, the balance being those which had been previously used for Bell System and commercial business. This percentage was determined from a statistical sampling against general purchasing records. Time did not permit a review in each individual case.

There follows a summary of these purchases:

Total suppliers used and payments to them

	Number	Percent	Payments in millions	Percent
	1956			
Large suppliers	1,292	21.1	$386.4	87.0
Small suppliers	4,814	78.9	57.5	13.0
Total	6,106	100.0	443.9	100.0
	1957			
Large suppliers	1,398	21.5	$270.6	83.2
Small suppliers	5,093	78.5	54.4	16.8
Total	6,491	100.0	325.0	100.0

We have used during these years a few large suppliers to whom many millions of dollars have been paid annually. The Douglas Aircraft Corp. of Santa Monica, Calif., received over $100 million in both 1956 and 1957, and the following construction companies were used in our DEW line and White Alice projects in Alaska and Canada:

	Million
The Foundation Company of Canada, Ltd.:	
1956	$54.9
1957	23.8
Morrison Knudson Co., Inc.:	
1956	37.4
1957	13.3
Northern Construction & J. W. Steward, Ltd.:	
1956	37.6
1957	3.3
Puget Sound & Drake:	
1956	27.7
1957	2.5

I am sure that these concerns, in turn, used a fair proportion of small businesses for their subcontracts and definite statistics on this subject could be obtained from them; provided, of course, the construction firms still retain their records.

We believe the elimination from our statistics of these five very large subcontractors produces the more representative picture given below:

	Number	Percent	Payments in millions	Percent
	1956			
Large suppliers	1,287	21.8	$127.7	68.3
Small suppliers	4,814	78.2	57.5	31.7
Total	6,101	100.0	185.2	100.0
	1957			
Large suppliers	1,393	21.5	$127.5	70.0
Small suppliers	5,093	78.5	54.4	30.0
Total	6,486	100.0	181.9	100.0

The figures on numbers of suppliers include some duplications, since they were obtained by adding figures supplied by several purchasing centers. However, we believe the percentages would not be materially altered if the duplications were eliminated.

C. "Procedures utilized in resolving contract, specification, and delivery disputes between your firm and the subcontractor."

We do not have many disputes with suppliers. I don't mean that suppliers are always happy with our pricing, inspection, et cetera, or that we are always happy with their performance, but we have been able to get along without lawsuits, arbitrations, or Government intervention.

Our contracts, generally speaking, do not provide for any mechanics for disposing of disputes aside from normal commercial methods. Some Bell Laboratories subcontracts make the disputes clause of the prime contract binding on subcontractors, but this is the exception, not the rule. Such disputes as have arisen have been disposed of in normal commercial fashion.

D. "The profit rate affixed by your firm to items furnished by your subcontractors and a list of the direct-cost items incurred by your company that this profit is intended to defray."

The profit rate affixed by Western to items furnished by subcontractors varies from 3 to 10 percent before taxes. The rate applied depends upon a number of factors, such as the size of the subcontract, whether the item is a component or subassembly and comes into our shop, or is a complete unit which is delivered directly to the Government. The overall cost of the subcontracting program is not included in the above figures. Such costs include administration, purchasing, inspection, technical and production assistance, financial, auditing, and may vary widely with the item subcontracted and the subcontractor involved.

In 1957, our overall profit on our Government business was 3.2 percent net after taxes.

E. "Designation of each of your first-tier subcontractors as large or small in accordance with the current Department of Defense numerical criteria."

For reply refer to question B.

F. "Comments on the subcontracting of classified items. Does your firm aid or assist a qualified subcontractor in obtaining plant security clearance or does a lack of such clearance constitute irrevocable disqualification?"

The fact that a supplier does not possess security clearance in no way disqualifies him from participating in our subcontracting program. The Western Electric Co. as a regular practice aids and assists subcontractors in obtaining security clearance from the time of requesting quotations on classified material until the orders are placed.

If suppliers with whom we intend to negotiate have not been cleared, a formal request is made by Western on the agency involved (Army, Navy, and Air Force) to inspect the facilities and personnel for clearance. When approval has been received, a DD–254 Security Check List is prepared by Western and forwarded to the local cognizant security officer for signature with copies to the supplier and the area cognizant security officer.

G. "During fiscal year 1957 and up to date, has your firm begun to self-produce items which it heretofore has subcontracted?"

Yes: to a small extent. During 1957 a reduction in business activity caused us to reduce our North Carolina works employment by some 300 people, mostly in assembly and associated work. We felt that our machine shop would be an essential unit in providing the technical skills required for the expected increase in business which did, in fact, later develop. We therefore placed in our shop some $360,000 worth of orders which we would otherwise have placed with the outside suppliers. This represented less than one-fourth of 1 percent of the total amount paid to subcontractors during the year and involved the effort of some 30 employees. The impact on other suppliers we believe to have been insignificant as this business, if placed on the outside, would have been spread over approximately 70 firms.

H. "During fiscal years 1956 and 1957, and up to date, have your total plant facilities been increased? If so, please furnish the total number of increased square feet, the nature or type of the new facility, its percentage of your overall plant footage, and the production item or service for which the new facility is being used."

Gross floor area during 1956 and 1957 increased by 126,016 square feet, or 4.2 percent, to a total of 3,126,531 square feet as of December 31, 1957. There have been no changes since December 31, 1957. All but approximately 7,000 square feet of the increase is rented space.

The major items contributing to this increase in floor area and the reason for the increase is tabulated below:

Location	Increase of floor space	Percent increase over Dec. 31, 1955	Reason for increase
Laureldale, Pa	65,520	2.2	Increased production requirements for transistors and varistors for military application.
Winston-Salem, N. C	26,470	.9	To take scrap disposal out of plant to release more space for manufacture.
Do	17,310	.6	To install and equip an engineering-training center.
Do	9,915	.3	Increased space required to fill military requirements for technical manuals needed by the armed services for installation, maintenance, and testing defense systems produced by Western.
Burlington, N. C	6,801	.2	Increased production schedules for the Nike-Hercules missile.
Total	126,016	4.2	

I. "Please indicate for fiscal years 1956 and 1957, and up to date, what additional Government facilities and equipment have been made available to your firm and what, if any, special financing considerations have been granted you by any procuring agency of the Government."

1. Government buildings and equipment valued at $12,559,000 were made available to us during the years 1956, 1957, and 1958. Of this amount, we acquired or built $7,022,000 worth on facilities contracts for which we were reimbursed. The balance of these facilities were furnished by the Government on a "GFE" basis.

The $12,559,000 includes:

2 test buildings at Bell Telephone Laboratories	$200,000
1 test building at Air Force base	1,000,000
1 test building at Burlington, N. C	4,197,000
Equipment and test facilities	[1] 7,162,000

[1] Of this amount, $661,000 worth was supplied to subcontractors.

2. Special financing arrangements granted by the Government: We made and purchased plant facilities amounting to $2,513,000 in 1956 and $3,102,000 in 1957, a total of $5,615,000. Of this total, approximately $600,000 has to date been certified by ODM as defense-emergency plant which gives the company accelerated amortization privileges in connection with computing Federal income taxes. The balance of $5 million is depreciated in accordance with the company's established procedures.

J. "Please give the total number of your employees, by the following classifications, as of the 1st of January 1956, 1957, and 1958:

"1. Administrative and managerial
"2. Engineering (including research and development)
"3. Clerical and sales
"4. Service and maintenance
"5. Skilled and semiskilled
"6. Unskilled."

Number of employees

AS OF JAN. 1, 1956

Classification	*Number*
Administrative and managerial	1,973
Engineering (including research and development)	4,052
Clerical and sales	4,049
Service and maintenance	1,147
Skilled and semiskilled	2,745
Unskilled	3,536
Total	17,502

AS OF JAN. 1, 1957

Administrative and managerial	2,315
Engineering (including research and development)	4,511
Clerical and sales	4,309
Service and maintenance	1,201
Skilled and semiskilled	2,980
Unskilled	3,924
Total	19,240

AS OF JAN. 1, 1958

Administrative and managerial	2,102
Engineering (including research and development)	4,982
Clerical and sales	4,283
Service and maintenance	1,153
Skilled and semiskilled	2,791
Unskilled	3,079
Total	18,390

NOTE A.—We have no sales force, as such, on Government business.

NOTE B.—The preponderence of administrative, managerial, engineering, and clerical people results from two main factors:

1. The large amount of subcontractor of equipment of our design; and
2. The management projects like DEW line and SAGE, which require substantial supervision and engineering support but which produce practically no production for our shops.

Senator SMATHERS. Now, that concludes the list of witnesses for this morning except for General Betts. In order to hear the general, we are going to have to have a closed session, so everybody will have to retire to the corridor.

(Whereupon, at 12:15 p. m., the committee went into executive session and was briefed on certain classified matters relating to the defense missile programs by Brig. Gen. A. W. Betts, military assistant to the Director of Guided Missiles. At 12:55 p. m. the committee recessed to reconvene tomorrow morning, April 30, at 10 a. m.)

THE ROLE OF SMALL BUSINESS IN DEFENSE MISSILE PROCUREMENT—1958

WEDNESDAY, APRIL 30, 1958

UNITED STATES SENATE,
SELECT COMMITTEE ON SMALL BUSINESS,
SUBCOMMITTEE ON GOVERNMENT PROCUREMENT,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10 a. m., in room P–63, United States Capitol Building, Washington, D. C., Senator John Sparkman (chairman of the committee) presiding.[1]

Present: Senators Sparkman, Bible, Goldwater, and Thye.

Also present: Walter B. Stults, staff director; Robert L. Weadock, professional staff member; and William D. Amis, professional staff member.

Senator BIBLE. The subcommittee will come to order. This is a continuation of the hearings by the Government Procurement Subcommittee of the Senate Small Business Committee covering the participation of our smaller firms in the missile, rocket, and outer space programs of the Department of Defense. We are very pleased this morning to have as our first witness the Honorable Perkins McGuire, Assistant Secretary of Defense.

Mr. Secretary, we are very happy to have you here.

Mr. MCGUIRE. I have a statement, Mr. Chairman, which I would like to read for the record, if I may.

Senator BIBLE. Very well, you may proceed in that manner.

STATEMENT OF HON. PERKINS McGUIRE, ASSISTANT SECRETARY OF DEFENSE (SUPPLY AND LOGISTICS), WASHINGTON, D. C.

Mr. MCGUIRE. Mr. Chairman and members of the Small Business Committee, I appear before you this morning to testify on the general policies of the Department of Defense with respect to small business in the field of missiles.

I feel that for purposes of this hearing it is not necessary that I cover our full program on behalf of small business. I am well aware of your dedication to the interests of small business, which I assure you we share. I know you are well informed about the importance of the small-business community in our national economy. I will, therefore, confine my comments this morning to the missile field.

As you know, I serve as a member of the OSD Ballistic Missile Committee. This committee functions to streamline the organizational alinement, management controls, and administrative procedures of the Department of Defense as they affect ballistic-missile projects by making possible simultaneous review, consideration, and decision on ballistic-missile matters by all concerned Assistant Secre-

[1] Senator Bible opened the meeting and subsequently turned the chair over to Senator Sparkman.

taries of Defense, the Bureau of the Budget, and the Director of Guided Missiles of the Defense Department.

Your committee recognizes the increasing part that missiles play in our total procurement programs. The following tabulation clearly indicates the growth of our major missile procurement programs in relation to our other major programs:

EXHIBIT 4

Fiscal year	Amount (in millions)	Percent of major procurement and production expenditures	Fiscal year	Amount (in millions)	Percent of major procurement and production expenditures
1952	$169	1.5	1956	$1,168	9.6
1953	295	1.7	1957	2,095	15.3
1954	504	3.2	1958 (estimated)	2,955	20.9
1955	718	5.5	1959 (estimated)	3,444	24.5

We are acutely aware of the impact this will have on the role of small business in our overall procurement programs and its effect on the share of our total business which will be awarded to small firms.

Mr. Holaday has already told you that the evolving patterns of missile procurement seem to indicate rather clearly that we will be buying either complete missiles or major components thereof. In either case, such items will usually have to be bought from business organizations with large engineering staffs, as a rule, organizations with more than 500 employees. From this it is clear that small business cannot hope to receive a substantial portion of our prime contract awards for missiles.

This is borne out by our reports showing that small firms received only 1.9 percent of prime contracts in the missile field during fiscal year 1957 and for the first half of fiscal year 1958, small firms received awards of 0.8 percent.

Even though small business cannot be expected to get a substantial portion of this prime contract business, nevertheless I still consider that we should not overlook any opportunity to make available to small-business prime contracts in this field which they are capable of performing. This will require continuing our educational emphasis upon engineers, procurement officials—in fact all who are taking part in the missile programs so that small business will not fail to get every consideration possible.

Nevertheless, I recognize that the principal place for small business in the missile field, at least in the immediate future, is in subcontracting. Based on special studies by the military services, it appears that about 20 percent of the money paid to prime missile contractors flows to small-business subcontractors in the first tier. You will be given more detail on this subject by the military departmental representatives who will appear during the course of this hearing. There is no question but that we should work with prime contractors to continue to encourage subcontracting with small firms. Likewise, there is no question but that we should also work with small business to assure that they are getting maximum opportunities to participate as subcontractors in the missile field.

It is the view of many in the contract operating field that it is not normally feasible to get advance commitments on a percentage of the

prime that will be subcontracted to small business. In a rapidly changing field, such as missiles, accurate predictions of the details of development or production programs are not practical. Many deviations from such commitments would be required to prevent program delays and contractors would be unwilling to assume full responsibility for such programs subject to commitments of this nature.

The Armed Services Procurement Act requires that the Government be furnished notice of cost-plus-fixed-fee subcontracts and of major fixed-price subcontracts under cost-reimbursement prime contracts. Some of our purchasing activities have extended this notice requirement to other types of prime contracts and have added a provision for approval by the Government. Sometimes this is on the basis of individual major subcontract approval and sometimes it is handled as a subcontracting system approval. In either case, its purpose has been primarily to assure that the Government was getting a fair price and, secondarily, to assure that we were not getting an unsatisfactory concentration, from different primes, of work which would overtax the capacity of some one subcontractor. Such control, however, has not been exercised to assure award to small business. I believe that steps must be developed to assure that in the review of subcontracts contracting officers give consideration to whether small business has been given reasonable opportunity to obtain such subcontracts.

It has seemed to us that one of the most important things for us to do is to furnish to small business the information it needs in order that small firms may bring their capabilities more apporpriatedly and specifically to the attention of the military departments and of prime contractors. In this connection, we have taken a number of steps as follows:

1. Review of subcontract: We are working with the Small Business Administration in a study of a selected number of prime contractors to review their methods and policies of subcontracting. From this effort, it is our objective to develop a subcontracting manual of the best techniques being employed to utilize small firms in the subcontract field. We would hope that such a manual would be helpful not only to prime contractors in placing their subcontracts with small firms but also to small-business firms so they will know how they may best fit into the subcontracting picture.

2. General procurement information on guided-missile programs: We have issued a bulletin on guided missiles. This bulletin on missile procurements includes (*a*) the guided missiles of the services currently under advance development, production, and use; (*b*) the names of the prime contractors for each missile; (*c*) the names of the principal subcontractors; and (*d*) appropriate military procurement offices to contact for more detailed information. The heavy demand for this indicates that it is well received and is helpful to industry.

3. Symposia: The services are conducting research and development symposia to discuss with business firms, including small companies, the goals and objectives in our missile fields.

4. Technical program planning documents: Further, the technical program planning documents released by the services to business firms on research and development is another step toward keeping business informed in this field.

You will hear more about these and similar individual efforts from the military departmental witnesses.

In research and developmental work generally, we find that awards during the first 8 months of the current fiscal year amounted to $1,907,225,000, an increase over the awards of the first 8 months of the previous fiscal year when $1,754,758,000 in contracts was awarded. The small-business percentage of this total, however, was only 2.6 percent as against 3.4 percent for the comparable period during the preceding fiscal year. The February percentage was 4.4 percent as compared with 3.4 percent for this same month in the previous year. For fiscal year 1957, the awards to small business totaled 4.3 percent. Total awards to all firms during fiscal year 1957 amounted to $3,033,143,000. Although the February figure of 4.4 percent is encouraging, we still have a long way to go during the balance of fiscal year 1958, if we are to reach last year's percentage.

An encouraging indication that bears on missile procurement in the research stage is found in our recent report of the 500 contractors listed according to net value of military prime contract awards of $10,000 or more for experimental, developmental, and research work in fiscal year 1957. It is significant to note that 155 of these companies are small business, which points out that where small companies are qualified and interested, there is opportunity for them in the research and development work of the military departments.

A further important indicator is our list of 356 small firms[1a] that received research and development contracts in fiscal year 1957, but did not have any defense research and development contracts in fiscal year 1956.

Both of these indicators give me an increased assurance that small business can participate in our development-type program, including the missile field, if we can but bring together the qualified small firms with out need for their valuable assistance and the contribution they can make to our defense posture.

In conclusion, I wish to thank this committee and its staff for its excellent assistance and suggestions over the past year. I know that you share our concern over the effects which the imperative demands of the missile program produce in our economy. We shall continue to welcome your assistance as we endeavor to administer our operations in such a way as to increase and further broaden the sources of the Nation's economic and productive force.

That concludes my statement. I have with me some of my own staff and, of course, we have also following us a substantial number of witnesses from the individual services themselves.

Senator BIBLE. Thank you, Mr. Secretary. I want to compliment you on a refreshingly responsive statement in keeping with the purpose for which this Small Business Subcommittee is conducting the hearings. I think it is a splendid statement. I would like to ask just a few questions.

I note on page 2 you state that the first half of the fiscal year 1958 small firms received in awards 0.8 percent. That obviously means that the larger firms would receive something in the neighborhood of 99 percent of the procurement dollars in the missile field. Now, do I understand from your statement that of that 99 or practically 100 percent of prime contracts, subcontractors receive one-fifth of that, or 20 percent?

[1a] Retained in committee files.

Mr. McGuire. I think, Mr. Chairman, in order to clarify this, this is a figure representing the first half of 1958. Now, I am not attempting to defend the figure. It is extremely low in my opinion but I think it only fair to point out that that figure is not necessarily the final figure, because a good deal depends upon the timing and the mix of what you put in here. In view of some of the problems we have had in our program, I have a great hope that this figure will be substantially higher. Now, specifically, in answer to your question, this 0.8 percent is the amount of guided-missile business that went to small business as prime contracts. Our figures indicate, in studying these prime contracts, that about 20 percent, and it varies in the overall, but aggregating that as an average, is subcontracted by the prime contractors to small business.

Senator Bible. Yes, I think that is——

Mr. McGuire (interposing). This is the first tier. We have not gone beyond that. There would be more added to that, I believe.

Senator Bible. Certainly, the committee does appreciate the activities and work that is being done in the field of assistance to small business in the subcontracting field. Now, specifically, what is done in the prime-contract field? I mean, what type of work is done to assist the small-business man in trying to obtain a prime contract?

Mr. McGuire. As you know, we have in the field small-business representatives, not only of the Small Business Administration but also of the services, reviewing these contracts. In particular, in the missile area, we have attempted to get together information to assist small business, that is primarily the individual looking for a prime contract, as to the type of thing that is being developed, where he should go to look for this and the procurement officer to talk to in the areas that are letting these contracts.

Senator Bible. Thank you, Mr. Secretary. One further question was elicited by your statement. Over on page 5, in the second paragraph concerning general procurement information on guided missile programs. How frequently are these types of bulletins put out?

Mr. McGuire. Unfortunately, I have a typed copy.

Senator Bible. This deals with your statement of making available general procurement information on guided missile programs. How often are those made available?

Mr. McGuire. This was put out recently, Mr. Chairman. I think this is very helpful to industry, and there has been a very heavy demand for this. This was not only released for our office, but Small Business Administration has distributed this, and it is our intention to keep this up to date and to reissue it as there are additional firms in the field.

Senator Bible. It comes out on a monthly basis or quarterly basis?

Mr. McGuire. No; I think it would be practical to put this out on a quarterly basis.

Senator Bible. I think that would be very helpful and I think the fact you have the very heavy demand you indicate does show that it does serve a useful purpose in this field. Thank you. Mr. Weadock.

Mr. Weadock. Mr. Secretary, we seem to have lost several billion dollars somewhere. Mr. Holaday, in his statement yesterday indicated that we were spending at the rate of $5 billion for missiles. Mr. Barnes from the SBA whittled this down to some $4 billion and we see that you come in with something more specific, $2.9 billion.

Mr. McGUIRE. Mr. Holaday is talking about obligations and in terms of hardware facilities and research and development. I am talking about the terms of missile procurement itself.

Mr. WEADOCK. Payments, you mean?

Mr. McGUIRE. Payments, expenditures. That is a confusing thing there, and I think it would be helpful for the committee, for the record, if we developed a table for you which would show the breakdown of Mr. Holaday's figure and the comparison of that on the expenditure basis so you have in front of you the program, the obligations, and the expenditures for these years.

Mr. WEADOCK. Fine. Thank you, sir.

Mr. McGUIRE. I will be glad to submit that for the record.

(The table and information subsequently supplied by Mr. McGuire follows:)

EXHIBIT 5

SUPPLEMENTAL INFORMATION SUPPLIED BY HON. PERKINS McGUIRE, ASSISTANT SECRETARY OF DEFENSE (SUPPLY AND LOGISTICS)

The statement of the Director of Guided Missiles that funds for missiles would be obligated at a rate of five billion dollars this year, referred to obligation programs for all categories of funds directly associated with missile programs, including Procurement and Production, Research and Development, and Construction funds.

The table below summarizes the obligational program for Missile Systems, from Fiscal Years 1946 to 1959. The Fiscal Year 1958 program, including the Fiscal Year 1958 supplemental appropriation, totals $5,107,000,000.

Department of Defense—Obligational program for missile systems,[1] fiscal years 1946–59

[In millions of dollars]

	IRBM and ICBM program	Long-range surface-to-surface missile program	Surface-to-surface missile program	Grand total, all missile programs
Fiscal year 1956 and prior	(2)	7	19	70
Fiscal year 1947	(2)	6	20	58
Fiscal year 1948	(2)	10	36	81
Fiscal year 1949	(2)	12	45	98
Fiscal year 1950		16	65	134
Fiscal year 1951	0.5	70	186	784
Fiscal year 1952	.8	103	240	1,058
Fiscal year 1953	3.0	179	406	1,166
Fiscal year 1954	14.0	213	350	1,067
Fiscal year 1955	161.0	330	559	1,470
Fiscal year 1956	515.0	591	902	2,270
Fiscal year 1957	1,365.0	1,587	1,968	4,470
Fiscal year 1958 (total) [3]	2,077.0	2,255	2,716	5,107
Basic 1958 budget	(1,440.0)	(1,618)	(2,039)	(4,430)
Fiscal year 1958 supplemental appropriation	(637.0)	(637)	(677)	(677)
Fiscal year 1959 (total) [3]	2,430.0	2,525	3,118	6,596
President's budget	(2,007.0)	(2,152)	(2,676)	(5,853)
Fiscal year 1959 budget amendment	(423.0)	(423)	(442)	(743)

[1] Program data contained in this table cover the developmental and capital costs involved in missile programs, i. e., the cost of bringing missile systems to an operational status plus the costs of procuring missiles and related equipment for operational purposes. These figures include all procurement, construction, and research and development funds directly associated with missile programs. These figures do not include military pay, operation and maintenance costs for operational missile units and sites and include only those shipbuilding and aircraft costs directly associated with providing missile capability.

[2] Excludes $2.3 million programmed in fiscal years 1946-49 for the Air Force MX-774 ballistic missile research program which was a precursor to the Atlas ICBM.

[3] Fiscal year 1958 and fiscal year 1959 basic amounts differ from last issue of this table due to refinements in estimates.

Source: Research and Development Branch, Budget, OASD (Comptroller), Apr. 17, 1958.

In addition to estimated obligations of procurement and production funds in the missiles budget category, the total of $5.1 billion includes about $100 million of funds in the production equipment and facilities category; $800 million of shipbuilding and conversion funds to construct or adapt ships specifically for missile use; $600 million for missile research and development, and installation support of missile research and development projects; and $400 million of miliatary construction funds for missile sites and facilities.

The data included in the statement of the Assistant Secretary of Defense Defense (Supply and Logistics) relate to expenditures of procurement and production funds in the missile category, for the production of missiles and associated ground equipment. Obligations in this category are estimated at $3,288 million for fiscal year 1958; this does not include estimated obligations by the reporting department which are to be reimbursed by sales to other departments. The estimate of expenditures of missile procurement and production funds is $2,955 million. The foregoing figures do not include funds in the construction, facilities, and research and development accounts which are to be used in connection with missile programs.

Mr. WEADOCK. Further, in connection with that breakdown, Mr. Secretary, in our discussion with Mr. Holaday yesterday, he indicated that in certain areas in the missile program they were proceeding to a degree of accomplishment whereby major components and subassemblies were being broken out; we have been under the impression that this might be favorable to our folks to get the overall components into major subassemblies which perhaps small business might be more successful of accomplishing. Is there anything that you feel you could do to encourage the military services in this direction and do you personally feel that it would be helpful to small business to break down the overall missile requirements for a single missile, into smaller subassemblies and components?

Mr. MCGUIRE. I would like to answer that question by its parts. There are really 2 or 3 points to it. I would like to take the last one first. Since Mr. Holaday, as he did yesterday, points out that the purchasing of these missiles either as a complete missile or as a major component, limits the prime contracts to larger firms, it would obviously help small business if we can achieve a breakdown of this. Secondly, I think the services will demonstrate to you that they are making some progress in this. I would like to make this observation and if you care to put it in the terms of a hunch—it is more than a hunch—it is the way I see it going, I feel that as these missiles develop they go through first the stage of research and development, and they get into the basis of a finished missile, and then they get into a production field, Certainly in the case of some of the smaller missiles, it is my feeling as they get accepted and become what you and I have formerly associated as a piece of hardware, there will be a greater opportunity to break these down, and I think Mr. Holaday pointed out yesterday and this would give an opportunity for small business. Mr. Holaday pointed out they are seeking to achieve some integration, I think you might term it, of some of these missiles. If they can accomplish that, I am sure this will do that. I would also like to add one other thing. I think the Navy in particular has had some experience in this field, and as they go on and learn more about this thing I believe that some of the components can be broken out so that they can be purchased individually after they have developed the missile. The main thing right now is that we get an operating capability out of this missile. Once you have got the operating capability, you are safe, and then you can start to break this thing down, in my opinion, to a much greater degree than they are doing now. This is an opinion

on my part only. I am not an engineer and really qualified to make that kind of determination, but I will certainly do everything on my part to pursue that course with the services.

Mr. WEADOCK. In reaching back once more to Mr. Holaday's testimony yesterday, after we pursued this question, he indicated to Senator Smathers that as far as his delegated responsibility in the procurement field was concerned, he had to lean very heavily upon your talents and your people to advise him in that one specific aspect of the missile program. I do not know, and we did not develop it too thoroughly with him, but he did make it abundantly clear that with regard to procurement, this was your ball of wax. We indicated to Mr. Holaday our information that the current small-business share of prime contract dollars in the missile field was less than 2 percent and ask him if he felt in his own judgment whether it would ever reach a level above this. Since he indicated that the whole procurement area is your responsibility, we would like to get an indication from you if you think we have reached a level for small business participation beyond which they cannot climb or whether you feel there is some room here for improvement on that percentage?

Mr. MCGUIRE. Well, I certainly think it would be a very negative approach for the Department of Defense to accept the philosophy that 2 percent is the maximum goal. I don't think anybody knows what the real percentage should be, but I see nothing to be lost and everything to be gained in this particular field of responsibility that I have in seeing to it that every effort is made to encourage small business and to use small business, that we consider this as a part of the evolution of this missile business and that 2 percent is not necessarily an indicator of what this potential is there. I think it can be higher, frankly, over a period of time.

Mr. WEADOCK. Thank you, sir. Referring to page 2 of your statement, Mr. Secretary, you indicate that in view of the size of the items and so forth, that it requires large engineering staffs and one thing and another which would establish the necessity for organizations having in excess of 500 employees. You go on to say from there—

> from this it is clear that small business cannot hope to receive a substantial portion of our prime contract awards for missiles. This is borne out by our reports showing that small firms received only—

and so forth, and then you set forth the statistics. At first blush it would appear that you have used your poor record in this field to justify your position. We are inclined to believe that it is a result of the system rather than the type of requirements. In other words, if the military services were successful in breaking down their requirements into components and subassemblies, like Mr. Holaday talked about yesterday, rather than to use the weapons system concept where the entire requirement is handed to one company and the entire thing is lumped together into one contract. If this system were perhaps amended in some fashion to follow the system which has been developed by, for instance the Navy, where in cases that we cited yesterday, they actually had prime contracts with 8, 9, or 10 different companies, for different assemblies and some of those companies happened to be small business. Obviously if you give the whole requirement for all components to one contractor this cannot possibly be a small contractor. So we feel that the system that you

are following is manufacturing this problem for us. If perhaps the system were amended in some fashion it might be more favorable not only to small business but perhaps to the Defense Department as well. For certainly, historically, we have knowledge of many cases where when small business was brought in, you got a good product for a cheaper price. I know you are well aware of those instances.

Mr. McGUIRE. I think, Mr. Weadock, we are talking in terms of comparison between the Navy and Air Force. They are, of course, a part of the Department of Defense. We have two different concepts here. The Navy is not doing this across the board in every case. For example, the Polaris.

Mr. WEADOCK. I appreciate that.

Mr. McGUIRE. A little bit of this comes out, of course, from the individual in the service who has the responsibility for bringing the missile into completion stage. The Air Force has the so-called weapons-concept system. They have a number of different types of this which they will cover with you in detail. I think Mr. Holaday pointed out yesterday that the Ramo-Wooldridge crowd out there, who, in effect, are management people, manage the program and do not do any manufacturing themselves. As to which system is right, I am not sure. Part of this is the responsibility of the people who are responsible to get this and they seem to evolve the methods that they now have. I will say to you that I personally have had a great deal of discussion with people in the services, Secretary Sharp, Mr. Bantz, and Mr. Higgins, on this overall philosophy and where it leads to 10 years from now. So it is not a subject that is frozen or a thing that is not under study all the time in this respect. Mr. Bannerman also would like to add something to that if he could, with your permission.[2]

Mr. WEADOCK. Sure.

Mr. BANNERMAN. I think all the services would agree that the likelihood of being able to break down these missiles into smaller components for procurement would occur rather late in the age cycle of the missile. For instance, you wouldn't elect to do that during the research or the experimental production phase. The missiles involved in that are the missiles which have been pretty firmly standardized at this stage of the game. You have that as a limiting factor in the terms of total dollars when you go into such a program.

Mr. WEADOCK. Can we look for it in the future? Do we render these missiles obsolete so quickly, Jim?

Mr. BANNERMAN. I think unquestionably you will see some of it. I think it depends to a degree on what kind of missile you are talking about. I think a large complicated missile with intricate compatibility problems would be less likely to get into this program than some of these smaller missiles, particularly the small ones which are being bought in very large numbers. However, I agree with Mr. McGuire completely that this is a problem that you can probably get better and more authoritative answers from the services.

Mr. McGUIRE. I would say the fact that the Navy is doing this and doing it rather successfully, is projecting the questions as to where we can go in this problem. I think it would be unfair to say at this stage of the game that this comprises the philosophy of the

[2] Mr. G. C. Bannerman, Director of Procurement Policy, Office of the Assistant Secretary of Defense (Supply and Logistics).

weapons management system as such. I think we are talking about a lot of things when we talk about missiles. We are talking about missiles with different sizes and different things that they have got to do, different areas of complexity. But certainly, I believe that the thing that the Navy is doing particularly with Talos and one of the other missiles are worthwhile so that it is incumbent upon the other services to see where that kind of treatment would be applicable to them. I just don't think we want a flat answer yes or no that this isn't possible I think it certainly bears exploration. If it has been working well in the Navy, why won't it work in a comparable type of situation?

Mr. WEADOCK. Well, actually, what we really have are 2 or 3 different types of systems, I guess. Of course, I think that each service probably uses, at one stage or another, all 3 of these different systems; they are not divided specifically into the 3 services. However, Mr. Secretary, you do leave the door open. Mr. Holaday somewhat closed it yesterday. He says we are proceeding into this type of weapon-systems procurement; that this is the way the trend is going and that this is the way we are pretty well solving these requirements. He indicated to us, as I interpret his testimony, that the experience trend is that we are going to have this weapon-systems concept for all of our missiles and, if anything, this system is even firming up. We, of course, would like to see the door stay open insofar as it can.

Mr. MCGUIRE. Mr. Weadock, maybe I am an optimist by nature. However, it does seem to me that my responsibility in this field is to see to it that the small-business opportunity is there to a maximum degree. So I think it is fitting that I should keep an open mind on this subject. Mr. Holaday's responsibility, of course, is the immediate procurement of this missile. He may well believe that he is right, but I intend to see what I can do to keep pushing this thing to see if we can have as much small-business participation as we can obtain and still get the missile we want. Of course, he is under considerable pressure right now in the terms of the major missile. As I say, when these get in the category of being accepted hardware, I still have feelings there are many areas of this thing that can be explored deeper.

Mr. WEADOCK. Well, Mr. Secretary, in the course of that exploration, in addition to the development of information for the small supplier which is referred to in your statement, can you think of any substantive procurement techniques that might also be employed here? We know that the Navy, and we hate to keep using the Navy as our prime example, have set-asides in the missile area, and Mr. Barnes also spoke yesterday of set-asides.

Mr. MCGUIRE. I think he mentioned 38.

Mr. WEADOCK. Well, I think something in the nature of $3½ million.

Mr. MCGUIRE. That is right.

Mr. WEADOCK. Something of that nature. Well, this is encouraging to us. We sort of get like the terrier with the bone, if we can get a nibble in here somewhere, we like to get on through to a point where we have an accomplished fact from which to work. I know that you will be advised on this later, but there was a large amount of difference between Mr. Holaday's testimony and that of Mr. Barnes. Well, that is a healthy condition. These are two viewpoints. We are

somewhat biased in favor of Mr. Barnes' approach to the problem admittedly, but we do wonder if there are some procurement techniques that your staff has brought to your attention or advised you upon. We realize that you know that there is a problem here. Considering the percentage of your expenditures that will be going into these fields in the very near future; if Mr. Holaday is right about that 2 percent, well, small business is in serious trouble as far as Government procurement is concerned. Just based on the pure arithmetics of the thing, we hope that perhaps he can be proven wrong. Certainly not in the missile field but on this one particular subject. We do feel, however, as Senator Smathers stated in his opening statement, that there are steps that have to be taken if we are not to just stand our ground here or tread water. I think it is going to be a hard uphill pull. It has every indication of this, speaking primarily at the prime contract level. I think that all of your activities and programs both unilaterally and jointly with the SBA for subcontracting are very healthful and very productive. However, we do not want to let go of the prime contract possibilities. This is where there still remains a direct relation between the Congress and the military. In subcontracts the Congress has no further relationship with the funds.

Mr. McGuire. Well, I think this, you mentioned the Navy and I mentioned earlier that the success that the Navy is having in this field can't be ignored and must be answered by the other services where it is applicable. I think in fairness to what Mr. Holaday said, and I have not discussed this with him since he was here yesterday, I did read his statement. He was talking about the whole missile field and I think it is fair to say that when we speak of missiles today that there is a certain amount of emphasis on those missiles which are the type of the Thor, of the Jupiter, or the Atlas or that type of thing. But we really have developed here families of missiles, if you will. And when we speak in broad generalities of missiles, we are apt to be somewhat misleading in the potential of this thing if we are thinking on the emphasis to the Thor or Jupiter, for example, and Polaris, whereas we do know there has been some progress in the other missiles that have come along, I think, pointing in the direction to which you are addressing yourself.

Mr. Weadock. Mr. Secretary, in response to the letter of the Chairman, to Mr. McElroy, is there someone in the military services that will speak on missile sites and bases?

Mr. McGuire. Yes.

Mr. Weadock. And will each military——

Mr. McGuire (interposing). We have organized this thing so the points of this letter will be covered item by item and if there are any we have overlooked, it is unintentional and we will certainly of course be willing to submit any other additional information you feel you want.

Mr. Weadock. We endeavored to explore with Mr. Holaday yesterday, security clearances and ASTIA and the "need to know" problem. Will this be covered by the services? [3]

Mr. McGuire. Yes; I can tell you briefly, ASTIA is in effect a library of information. We do have a real problem here and I want to face it squarely. The problem is a little bit as Jim Bannerman

[3] See Mr. Holaday's testimony, p. 17.

explains it, the chicken and the egg business. If the fellow has a contract, he has a "need to know." If he doesn't have a contract, does he have the need to know? How does he get clearance to have this information made available to him? And the manpower people who have charge of this area of that, have been asked to look into this thing and review it. Obviously this is a field of some sensitivity and people out of plain curiosity should not have access to it. On the other hand, if people have a capability and desire to participate in this thing, it seems to me within reason we should make every effort to make this information available to them.

Mr. WEADOCK. Well, sir, the way it has been explained to us, there is another colloquialism other than Jim's that might supply "the dog chasing its tail"; the firm has difficulty getting the contract because he doesn't have a contract to give him the "need to know," and consequently can't get anywhere. What do you presume will be the outgrowth of this study and what is——

Mr. MCGUIRE (interposing). As far as I am concerned, Mr. Weadock, the objective of the study should be that on a reasonable basis, those people who have capability should be in a position to qualify to bid on this area and to get access to this information. I must recognize, however, that there is going to be some area of difference of opinion here because individually a lot of people think they have the capability and other people might not agree with that. But my objective would be to simplify this procedure. The purpose of this is to open up broader fields. As I mentioned in my closing statement, I was very much encouraged by the number of small businesses that had taken on research and development contracts that did not have them a year ago. This is prima facie evidence to me that there is capability in this field. This is helpful in putting down the argument that there just isn't capability here. Well, there are three-hundred-odd firms here who have shown that capability. Now, I must also recognize that as the art advances and we get more expert, I have got to give credit to the fact that possibly we work better with those firms to make it possible for them to get into this picture. I think there are two sides to the story, but this encourages me and I think it puts an incentive on the services also to recognize this. I think the services do recognize this. They have no reason not to from their own point of view.

Mr. WEADOCK. Then we can assume that there is a study being made of this problem?

Mr. MCGUIRE. Yes, sir; and I shall keep you informed of the results of it.

Mr. WEADOCK. Thank you, sir. I have one additional question Mr. Chairman.

The CHAIRMAN. Yes, Mr. Weadock.

Mr. WEADOCK. The Subcommittee on Government Procurement recommended in 1 of its 2 reports last year that steps be taken by the Department in cases where a prime contractor had made a request for additional Government facilities, either plant facilities, machine tools tools, or what-have-you, that this be surveyed in very sharp fashion by the Military to insure that in the adjacent or nearby area there were not some small-business machine shops that were just about to go to the wall. I wonder if anything substantive has taken place to implement that recommendation. I don't believe we have heard

directly what steps have been taken, if any. I wonder if you could advise us on that, Mr. Secretary.

Mr. McGuire. I must be frank with you, I am not prepared to answer that question. I am not avoiding it; it is an oversight on my part, but I will see that the answer to that question is specifically supplied to you.

Mr. Weadock. It seems to relate directly, Mr. Secretary, as I am sure you understand——

Mr. McGuire (interposing). I just don't want to be ad libbing out of memory an answer of that type.

Mr. Weadock. No; that is not our purpose. Our purpose here, of course, is to illuminate the fact that these multimillion dollar contracts do go out to some established primes; they necessarily have to take out hundreds of thousands of dollars worth of space in the New York Times and other newspapers advertising for more engineers to accomplish these contracts. We feel that perhaps there may also be some trend toward acquiring additional plant facilities in keeping with this idea of self-producing which was first recognized last fall. So we want to know if anything can be done in that connection.

Mr. McGuire. That is right. I will supply that for you. This is an important problem and I think it is one the committee is entitled to a specific answer on.

(The requested information, subsequently supplied, follows:)

Exhibit 5 (b)

Supplemental Statement by Hon. Perkins McGuire, Assistant Secretary of Defense (Supply and Logistics) Furnished After the Hearings in Response to the Question Raised by Mr. Weadock on Page 93 of the Transcript

Basically, as you know, the matter of furnishing facilities to industry for the production of defense items requires the exercise of good judgments, and such judgments involve the manufacturers of missiles as well as manufacturers of other defense items. However, in direct response to your question, let me apprise the committee of our policies and actions being taken in this area. In discussing our published policies, I will make reference to a number of documents, copies of which I am furnishing to the committee. The first one, is Department of Defense Directive 4275.2, dated October 6, 1956, concerning overall plant facilities, including land, buildings, structures, machine tools, and production equipment. I quote the basic policy expressed in this directive as follows:

"The Department of Defense supports the basic principle that free competitive enterprise should be fostered by the Government. Therefore, the provision of Government-owned industrial facilities will be authorized only when it can clearly be demonstrated that private enterprise is unable, unwilling, or not organized to perform the service or provide the products necessary to meet current and mobilization requirements, or that in the execution of the military mission, the ownership of the facility by the Government is a necessity * * *. Prior to providing Government-owned industrial facilities for the production of new weapons or for the expansion of production for existing weapons, efforts shall be made in all cases to utilize existing facilities to the fullest possible extent."

About the time of issuance of the committee's report in August 1957, which questions the tax amortization program, Public Law 85–165 was passed which drastically curtailed such program and the use of certificates of necessity. Subsequently, we issued an implementing directive, 4200.10, dated March 27, 1958, under which favorable consideration of a request for certificate of necessity is given only when the proposed facilities are to meet those "current or currently foreseeable requirements" of the military or the AEC and then only for new or specialized Defense items or for research and development facilities. In either case, it must be determined that existing capacity is unsuitable before the application will be approved.

We have also, on March 27 of this year, issued DOD Directive 4005.14 which specifically requires that reliance be first placed on existing private facilities for "planned" emergency or mobilization capacity before considering the furnishing of Government-owned production equipment or establishing Government-owned plants. Many small-business men are included in our planning.

Our armed services procurement regulation also contains guidance concerning the furnishing of facilities. I should like to quote paragraph 13–102.3 which is a short statement on that subject:

"It is the general policy of the Department of Defense that contractors will furnish all facilities required for the performance of Government contracts. However, subject to and within the limitations of existing authority, facilities may be provided by the Government for use by contractors when such providing is considered necessary to meet essential production or program schedules, or when otherwise considered by the Secretary of the Department concerned to be in the best interest of the Government."

As I mentioned before, the exercise of good judgment is required in this matter of facilities; consequently, considerable responsibility is placed on each military department to carry out the fundamental policies properly. I have reason to believe they have done this job well; for each has developed stringent screening processes through which each application for facilities must pass. However, they can tell their stories better than I. But it may be of interest to the committee that the departmental procedures for approving facility expansions require that the comments and recommendations of the small-business specialists be obtained, including information as to existing capability of small business.

I believe our policy guidance with respect to furnishing facilities to prime contractors to be basically healthy as it preserves the position of small business in the subcontractors field; however, I shall be pleased to discuss such efforts and directives with the committee at any time, particularly if our concepts with regard to the furnishing of facilities may appear to have been detrimental to small business in any case.

Attached for the committee's information are copies of the DOD directives referenced above.[3a]

Mr. WEADOCK. Sir, in connection with your research and development proposal, I think it is very timely. We received a report from the Army just recently, which confirmed our fears that out of a total of 46 research and development contracts, 25 of the production contracts going out to them, went to the people who did the research and development for well over 50 percent. We have an overall small-business total of 19 percent of prime contracts. That is fine, but when small business has less than 5 percent of the research and development contracts, we realize that the production contract grows out of that, and when in 50 percent of the cases then go to the researcher and developer, it cuts small business down to a nub. So any attention the Secretary can focus on that problem, we feel would be constructive. Mr. Chairman, I have no further questions.

The CHAIRMAN. Thank you.

Mr. MCGUIRE. I have one statement I would like to make, Mr. Chairman, and I think it is appropriate. I would like to compilment this committee, and I say this very sincerely, on the emphasis they put in this field. This problem of small business in the research and development field, and in the missile field, is one that has been certainly of interest to this committee and interest to us in the Department of Defense and in the services, but I cannot help but believe the emphasis your committee has put on this subject particularly, is going to be worthwhile. Any time there is a detailed emphasis and highlighting of a thing there can't help but be some good fruits, and I compliment the committee on holding hearings on this subject.

The CHAIRMAN. Thank you, Mr. Secretary, we are delighted to have you and your associates.

[3a] Department of Defense directives reproduced as appendix 3, p. 229, appendix 4, p. 231, and appendix 6, p. 247.

The CHAIRMAN. The next witness is the Honorable Dudley C. Sharp, Assistant Secretary of the Air Force. Mr. Secretary, will you come around, please? All right, sir, do you have a prepared statement?

Mr. SHARP. Yes.

The CHAIRMAN. Just proceed in your own way. We have copies of your statement.

Mr. SHARP. Yes.

STATEMENT OF HON. DUDLEY C. SHARP, ASSISTANT SECRETARY OF THE AIR FORCE (MATERIEL)

Mr. SHARP. My name is Dudley C. Sharp, and I am Assistant Secretary of the Air Force (Materiel), and with your permission, I would like to read my statement.

General McCorkle, Assistant Chief of Staff for Guided Missiles, will tell the committee how missile projects are initiated in the Air Force. General Senter, Director of Procurement and Production, Headquarters Air Materiel Command, will discuss specific aspects of the missile programs in the area of procurement and production. The field pertaining to Air Force ballistic missiles will be handled by General Funk, Director of Procurement of the Ballistic Missile Division, Inglewood, Calif. He has a good deal of experience in the work the Air Force is doing in the field of ballistic missiles. He will present some interesting data on the participation of small concerns as subcontractors. Present indications are that our prime missile contractors are giving their full support to subcontracting with small concerns. General Fulton, representing the Air Research and Development Command will explain how that Command works with technically competent small concerns possessing capabilities in research and in the development of hardware used in Air Force missiles.

At the very outset I want to make it clear that we are in no sense apologetic for the efforts we are putting forth to assist small business. We feel very strongly that the Air Force small-business program is well organized, dynamic and designed to give all small-business concerns the maximum opportunity to share in our missile programs as prime contractors and subcontractors.

The basic procedures and the organization structure of the Air Force small-business programs which are the means by which we accomplish our objectives have been explained to your committee a number of times. They are, as you know, specifically tailored to combat the extreme difficulties we face because of the highly technical and complicated equipment we buy. The procurement of missiles has not changed this picture, nor has it dictated the need for any sweeping changes in our program. Such changes as are needed will be made as the requirement becomes evident. However, our major efforts will be directed toward insuring that the excellent techniques now available are being fully implemented. The evidence we have indicates that they are now being used effectively.

In the area of ballistic missiles alone, 21 percent (more than $267 million) of all money paid by the Air Force to Air Force prime contractors has gone to small concerns as first-tier subcontractors and suppliers. Further statistics will be presented by subsequent Air Force witnesses.

I referred a minute ago to those changes that will be made as needed. While we have had an able small-business specialist working in the Los Angeles area, who worked very closely with General Funk's operation, he has not located specifically at Inglewood. We feel that considerable benefit will be gained by designating an individual to work specifically on our ballistic-missile program. Consequently, such a man was selected and is now on the job. This is the kind of change we intend to make, where appropriate. In this regard, I have directed that all responsible Air Force echelons, in conjunction with appropriate small-business specialists, reevaluate their respective programs so that we can be sure we have in being the tools we need to assist small concerns whose capabilities lend themselves to Air Force missile work. If any additional tools are needed, we will promptly provide them.

I want to assure this committee again that I have personally stressed, on a number of occasions, the importance I attach to a healthy small-business community. I also believe an important factor in keeping our country prepared is the maintaining of a balanced economy among our Nation's industry. This attitude prevails throughout the Air Force from Secretary Douglas right down to our contracting officers in the field. Doing business with small concerns is as important to us as it is to the small-business firms who want Air Force contracts. We deal with small firms not because they should be subsidized, but for the very practical reasons that in specific types of work they have the ability to produce efficient results in a very short period of time. Also, within the small-business community there is a degree of ingenuity and freedom of engineering effort which is an invaluable asset. We will continue to rely on this ability.

I believe that the testimony that will follow will give the committee a fuller understanding of the Air Force missile program as it relates to small business. General McCorkle will now deliver his statement unless you have some questions to ask beforehand.

The CHAIRMAN. Thank you, Mr. Secretary.

General McCorkle.

STATEMENT OF MAJ. GEN. C. M. McCORKLE, ASSISTANT CHIEF OF STAFF FOR GUIDED MISSILES, HEADQUARTERS, UNITED STATES AIR FORCE, WASHINGTON, D. C.

General MCCORKLE. Mr. Chairman and members of the committee, my purpose here today is to give you the general framework of how a missile project is initiated in the Air Force. I believe that when you understand the background, the effort, the thought, and the direction that goes into the origination of a missile system you will be able better to correlate the information which you will receive from Generals Senter, Funk, and Fulton concerning procurement as related to small business.

Ideally, a missile system begins, in embryo, with what we call a qualitative operational requirement or, for short, QOR. This QOR is developed by one of our major commands and it lays before us a mission that must be accomplished and sets forth characteristics of a weapon system to accomplish this job. It contains such detailed requirements as missile weight, accuracy, mobility, handling ease, and so forth. Further, a QOR recommends a time period in which

this missile system is required, in order to dovetail with other offensive and defensive weapon systems. This paper is accepted by Air Force headquarters and studied quite extensively by the many staff agencies. We determine whether or not a logical extension of another system could do the job as effectively or more economically, and whether or not there is, in fact, a valid requirement for a new system.

If we determine that there is a valid requirement for a new system we publish a document called a general operational requirement or GOR. Because of the specific nature of the requirements outlined in the GOR and because it must satisfy as many users as possible, considerable effort is required to coordinate it completely within headquarters and with all using commands.

Once USAF approval is obtained and the document published, our Air Research and Development Command (ARDC) gets into the act. Upon receipt of the GOR, ARDC headquarters examines the GOR and sometimes expands it to include certain desirable development objectives within the known state of the art. They publish a new document which includes our GOR and their additions to it. This new document is called a systems requirement (SR).

The systems requirement is forwarded to a development center where it is examined by the experts. If the development center has sufficient knowledge to evaluate this particular system they will write an abbreviated development plan. If they feel that they need additional input, they may consult with industry, or other Government agencies regarding certain technical feasibility aspects of the plan. The abbreviated development plan is then established. The plan will contain the initial requirements for development of the system including time schedule, expected production schedule and fund requirements by type and fiscal year. The plan is then forwarded to Air Force headquarters for approval. In our headquarters the development plan is examined in relation to the original GOR and to other offensive and defensive weapon systems in our arsenal. Assuming that the requirement for this particular system we are discussing has sufficient priority, we will expect to add it to our program, or substitute it for another system which is approaching obsolescence. We also place it into our budget cycle. At this point, we begin an additional coordination process. We begin coordination with the Office of the Secretary of Defense, and in particular the Office of the Director of Guided Missiles. When the programing and budgeting and approvals have been completed, Air Force headquarters issues a development directive to ARDC.

It is at this point that ARDC establishes a Weapon Systems Project Office (WSPO). Bid kits are released to interested industrial firms by the Air Materiel Command. When the various contractors have determined their solutions, they will present their proposals to the AMC/ARDC Source Selection Board which will make a determination as to what contractor should be awarded the contract.

There is an additional step necessary. In order to negotiate a research or development contract, a determination and finding must be made. If the amount involved is $100,000, or less, this is done by the contracting personnel. If the amount is more than $100,000, the Assistant Secretary of the Air Force must make that determination and finding. In those areas where successive contracts need to be made, on an expeditious basis and in regard to one project, class

findings are obtained. These remain effective until the end of the fiscal year. In these documents the Weapon System Project Office outlines the manner in which they want the contractor to proceed, the scope of contractor work, the funds required for the first fiscal year, and several other details concerning procurement. After approval of this determination and finding form by the Assistant Secretary of the Air Force, we are then free to negotiate a contract.

Again I'd like to say, I have been describing an ideal situation. Many times, in the interest of either time or other considerations, we delete certain steps or we add to certain steps. In actuality, the Source Selection Board does not, by itself, choose the prime contractor for major systems. Rather, the Board's recommendations are reviewed at Air Force headquarters and secretarial level, and final approval is accomplished at that level. On a very important or large project, this review procedure may go as high as the Secretary of Defense himself before approval is firm. This, then, is how a missile system progresses from an idea to the hardware state.

Now that we have reached the stage of letting a contract, we will hear from General Fulton who will cover the research and development phase of our presentation.

The CHAIRMAN. Thank you very much, General McCorkle. Do you have any questions at this point or do you prefer to go on?

Mr. WEADOCK. No, sir.

The CHAIRMAN. Go ahead then, General Fulton.

STATEMENT OF BRIG. GEN. LEE W. FULTON, DIRECTOR OF PROCUREMENT, AIR RESEARCH AND DEVELOPMENT COMMAND, ANDREWS AIR FORCE BASE, WASHINGTON, D. C.

General FULTON. Mr. Chairman and members of the committee, my statement today will cover that portion of the letter from your committee to the Secretary of Defense, dated March 28, 1958, referring to research and development as it pertains to Air Research and Development Command (ARDC).

The Air Research and Development Command's job is to insure qualitative superiority of the United States Air Force's new weapons. It is the vital link with the science-industry complex upon which the Air Force must depend to maintain supremacy in the Air Force to be and the Air Force in being.

Three of the principal efforts being made to fulfill this requirement are—

(1) Making big technological jumps by imaginative research programs aiming at major scientific breakthroughs.

(2) Translating new equipment whose feasibility has been proven by research and development into standard production-type items.

(3) Cutting drastically the time required in converting a concept into hardware. Approximately one-third of the Air Force dollars allotted to the Air Research and Development Command are obligated in exploratory and applied research programs.

Contracts are negotiated with educational institutions and nonprofit organizations to determine new fundamental knowledge. Applied research is solving specifics after approval of basic concept.

Contracts in this phase are let with large and small concerns, in accordance with their technical skills and competence.

In conformance with Air Force small-business policy, the Air Research and Development Command is making a sustained effort to utilize technically capable small concerns in its programs. It must be understood, however, that our first concern must be the technical competence of any organization with whom we contract.

With regard to the three specific items of interest in this area that your committee outlined, I will discuss them in order.

NEGOTIATED VERSUS ADVERTISED BIDDING

To effectively utilize the advertised bidding process, there are several factors which must be present.

(1) Adequate description of the item so that all prospective sources can bid on an equal basis.
(2) Details of item may be publicized.
(3) Multiple sources are available.
(4) Price is prime consideration.

In contracting for research, there are two channels from which techniques are generated. One is through unsolicited proposals or inventions, and the other through Air Force sponsored investigation. In either case, we are buying the technical competence of people to develop ideas. Until such time that assurance is evident that a practical item can be produced, none of the criteria for advertised bidding is in existence which necessitates using negotiation.

TYPE OF CONTRACTS BEING UTILIZED

Previously, I mentioned contracting with universities and nonprofit organizations. In dealing with these organizations, we ordinarily use cost-reimbursement contracts with no fee involved. Another group we deal with is known as not-for-profit organizations (for example, Rand, Inc., Armour Research Institute). They are given cost reimbursement plus a nominal fixed-fee contract. They pay no dividends, and the fee is invested in the institution which increases their capacity to support research and development programs. Commercial organizations are also utilized and they are awarded either cost-plus-fixed-fee or fixed-price contracts.

Cost-type contracts are utilized since during the performance of the contract the direction of effort may be radically changed. This is not the case in the purchase of hardware where firm specifications and fixed prices may be determined.

FACTORS CONSIDERED IN SELECTING FIRMS TO BE SOLICITED FOR BID

The most compelling factor is the technical competence of the individual or firm under consideration. This does not necessarily mean the number of engineers and scientists. The quality and capability of these people are the primary determinant. The financial responsibility, facilities available to perform the work, ability to obtain security clearance, and performance experience on previous contracts are also major factors considered.

In order to disseminate information on projected programs as widely as possible to both large and small firms, there was initiated in October

1955 the technical program planning document (TPPD) procedure. Qualifications to participate in the program are as I have just outlined. If an otherwise qualified organization lacks the security clearance required to receive classified research and development objectives, the Air Research and Development Command will take the steps necessary to assist the company to obtain such clearance.

At the present time, there are 1,327 firms approved to receive technical program planning documents. There are 751 firms actively participating in this program of which 307 are classified as small business.

There are small concerns acting as prime contractors in the missile research program. Such a concern is John R. Thompson who has been awarded a contract for the preparation of a production design handbook which is of a highly technical nature. These are the concerns that have developed specialized knowledge and strong engineering and scientific staffs and are constantly working on proposals which they present to the Air Research and Development Command for evaluation. In many instances, they form groups with one concern acting as group captain. As an example, Hoffman Electronics is acting as team manager of a group working on a new airborne electronic reconnaissance system in the amount of $11 million. The group is composed of Stanford Research (nonprofit), Sanders Associates, Inc. (small business), Cornell Aero Laboratory (nonprofit), Filtron, Inc. (big business), Radiation, Inc. (small business), Unitronic division, Siegler Corp. (big business), Lockheed Aircraft Services, Inc. (big business). When the group makes a formal proposal, it shows the areas in which the individual concerns will operate. By these methods the ingenuity of technically competent small businesses is utilized by the Air Research and Development Command in the research and development of missile programs.

In the development of any of our programs since we do not follow the arsenal concept, the Air Force must utilize the engineering and technical capabilities of companies, both large and small, in developing design specifications, and engineering details. With our limited staff of engineers and scientists, we are able to technically evaluate the performance specifications which state the functions a device must perform, its major limits (such as weight, size, power input, and so forth), and its operating features. A performance specification tells what we want an item to do, not how to build it. The contractor who has submitted the best approach to the problem is awarded a contract to develop the design specification which delineates an item in such detail that it can be fabricated in exact accordance with the specification data. These design specifications must be complete in all detail as they are the basis for procurement actions by the Air Materiel Command when the item has been developed to the point of production.

It is our intention to continue to use to the extent possible those technically competent small businesses not only in the missiles program but in all other areas of our Air Force research and development programs. We are even now developing a plan for a realinement of our field organization which will place Air Research and Development Command regional representative offices in those areas where the concentration of our research and development effort is heaviest.

This realinement will enable us to render greater assistance and guidance to the small-business element of United States industry.

Mr. Chairman, that completes my statement.

The CHAIRMAN. Thank you, General Fulton.

Sneator THYE. Might I ask a question? On the concluding page you state:

> We are even now developing a plan for a realinement of our field organization which will place Air Research and Development Command regional representative offices in those areas where the concentration of our research and development effort is heaviest.

Well, how will that office function? Will they take the specific contracts that are the primary contracts that might have some value, to the smaller operator as a subcontractor? Will you make the information known to those in areas where there isn't the concentration? I can see that you would be possibly faced with Philadelphia or some such a center as being a concentrated area, but you might not have any such representation out in St. Cloud, Minn., and yet you might have some business people that will be qualified to render almost perfect service as a sublease contractor. The question is, how will you get the information from that center where your heavy concentration is to an area, whether it be out in Arizona or Minnesota or where it might be?

General FULTON. This establishment, as we are planning it at the present time, will be based primarily on our distribution of research contracts in the educational institutions and the not-for-profit type of organizations which are those that I cited in my record, Rand, Inc., Stanford Institution, Franklin, and Battelle, those of that type. At the present time it appears that this distribution will cover about 14 points. These 14 points are based on approximately 23 universities which have the highest number of our research contracts. To be specific on this, the University of Minnesota is one of those which has a basic agreement and therefore one of these offices would be established in that area. These offices, the regional representative offices, would have an area responsibility similar to that that our air procurement districts have at the present time under the Air Materiel Command. It is planned that there will be an element in the regional representative offices which will be designated as "contractors relations" and will have the responsibility of doing exactly the job that you outline in regard to research and development work. We would then be closer to the industry people and it would be easier for these people that have this technical capability to get to our people and advise them as to what their competence is and for our people to advise them where we can utilize their capability and how to go about making the necessary contacts to follow through.

Senator THYE. In other words, General, they would make it known by communication through service clubs or advertising as to what could be found there at the university center and someone that had ideas or had machine-shop equipment, could go there and ascertain whether they could find anything of which they might be engaged in?

General FULTON. Exactly, sir. How they do business with us on research and development.

Senator THYE. Because the small-business man could not have the technician and the so-called expert in the field constantly searching

out the information. You have got to bring it to them if you are going to render them a service.

General FULTON. That is it, sir.

Senator THYE. Thank you, sir.

The CHAIRMAN. Thank you, General Fulton.

Mr. SHARP. We have General Senter, who would like to make the next statement if you have no further questions.

The CHAIRMAN. All right, General Senter, we will hear from you.

STATEMENT OF MAJ. GEN. W. O. SENTER, DIRECTOR OF PROCUREMENT AND PRODUCTION, AIR MATERIEL COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO

General SENTER. Mr. Chairman and members of the committee, as this is my first appearance before your committee and because I have a large part of the Air Force responsibility for procurement matters, perhaps it would be well to give you a brief word about myself at the outset.

Since August 15 of last year, I have been Director of Procurement and Production of the Air Materiel Command. Since the war, I have held various command positions which included some responsibility for limited procurement matters. For 3½ years prior to assignment in my present job, I commanded one of the Air Materiel areas and in that job had a more substantial degree of responsibility for procurement matters, but it was not until last August that I became directly responsible for a major portion of the procurement functions of the Air Force. Under these circumstances I obviously am not as knowledgeable of the many ramifications of procurement as I expect to be in the future. On the other hand, I take a serious view of these responsibilities which have been assigned to me, among them being the placing of small business in the Air Force procurement program.

One of the first things I did on coming to Dayton was to request briefings from my people on various aspects of our procurement and production mission. Included in these briefings was one on our small-business activities. I was impressed at the time with the sincerity of our people working on this program and with the effectiveness of their efforts within the small-business potential. They believe in the program; I believe in the program, and it is being pursued with the kind of purpose which you would approve if you had the opportunity of observing it on a day-to-day basis.

Our small-business program is a management function and is implemented across our complete procurement spectrum. The implementation of the program is directive upon all Air Force procurement agencies and personnel alike, notwithstanding the type of item or system under procurement. In other words, our small-business program is all encompassing and applies equally against missile procurements as against all other.

It is a program that has helped the Air Force place with small business, direct in prime contracts, an increasing amount of dollars each year since 1955. It is a program that has seen about 100 of our large prime contractors pay to small-business concerns, as first-tier subcontractors, $1,842,002,000 during 1957.

The Air Force does not leave its small-business specialists to do their job alone. In 11 different sections of Air Force procurement

instructions, each section concerned with one specific phase of procurement, there are instructions regarding the consideration to be given small business. Another example is Air Materiel Command Manual 70–3, a guide to administrative contracting officers. This manual requires administrative contracting officers, when reviewing the contractor's purchasing system for approval, to give consideration to the adequacy of the contractor's small-business subcontracting program.

In your hearings of previous years, your committee has, I am informed, received a rather detailed description of the procedural aspects of our small-business program. For that reason, my statement avoids that repetition, and instead will be confined to the general outline of interest items submitted by Senator Smathers in his letter of March 28 to the Secretary of Defense.

The committee specifically requested statistics regarding small-business participation in our missile program. I am unable to comply with this request as comprehensively as I would like, since the procurement-action reporting system does not provide statistical runs of this kind. However, to give your committee the best possible data, since being alerted to the needs of your hearings, my staff and I have developed some statistics pertaining solely to missiles which I shall submit a little later for your consideration.

Before getting to specific issues however, grant me just a moment to establish the general frame of reference within which I hope to treat those items of greatest interest to your committee.

I wish to point out that my statement will pertain to the Air Force family of nonballistic-type missiles being procured from our Command Headquarters complex in Dayton, Ohio. General Funk will present our ballistic missile programs to you. My objectives are to answer your specific requests by introducing your committee to our missile programs; to reflect our experience with the weapon-system contractor method of procurement; to indicate why small business normally cannot be selected as overall weapon system contractors; to show, on the other hand, the degree and significance of the small-business contribution to our programs; to indicate why we have resorted more to contractor furnished equipment in comparison to Government-furnished equipment for our missile systems; to reassure you in the matter of negotiated versus advertised bidding; to review the types of contracts we employ; to touch upon the vital ground-support equipment problem and site construction; to briefly discuss certain aspects of the DEW line procurement; and finally to present statistics which, I feel, reveal a healthy small-business support to our missile effort.

The matter of missile procurement is an involved and complex management problem for the Air Force because of the broad spectrum of different type missiles required to assure Air Force ability to perform its worldwide defense responsibility. For example, we must have both surface launched and air launched missile systems. Specifically, for area Air Defense of the United States, we have a relatively long-range surface-to-air missile. Additionally, we have several types of air-to-air missiles which are fired from our supersonic interceptors; we have surface-to-surface missiles ranging from intermediate to intercontinental ranges, which are of the nonballistic type; we have air-to-surface missiles which can be launched from our long-range bombers; and, of course, we have our family of ballistic

missiles. To keep each of these varied programs on schedule against the set timetable, while keeping under control the variables involved, is not only a tremendous task for our procurement personnel, but is a formidable challenge to our Air Force contractors as well.

The Air Force accomplishes management surveillance over these varied programs by selecting a weapon-system contractor for each missile system. These contracts are so written as to make it a contractual obligation and responsibility for the system contractor to coordinate all the vast effort required to develop and produce an integrated missile system. By this method the Air Force conserves and concentrates its available technical and management talent to effect "single point" direction of each program to insure overall system requirements are met. The system contractor is the agency which implements and coordinates that direction throughout the industrial complex to develop, fabricate, assemble, test, and integrate hardware into a system which meets the Air Force weapon requirement.

It follows, then, for one to qualify as an Air Force missile weapon-system prime contractor, he must have broad management know-how which is backed by a rather large and diversified technical staff. If he is to supply substantial portions of the hardware, he must have extensive fixed plant and testing facilities, and, a corporate level financial stature to initiate and sustain activity across a broad front. To round out the industrial team required, he must secure selective subcontractors to supply specialized services not inherent in his organization. As a matter of fact, examples can be cited where large corporations invited by the Air Force to compete for missile-system prime contracts, after reviewing the requirements of such systems, have voluntarily joined forces on a prime-major subcontractor basis in order to provide a management-technical team adequate to the task involved. In the past competitions, we have received system proposals from such formidable alliances as McDonnell Aircraft Corp/General Electric Corp.; Grumman Aircraft/General Precision Equipment/Olin Mathieson; and, on a competition now being considered, we have one team which consists of Boeing/Chance-Vought/General Electric/North American, missile division. This, gentlemen, is the magnitude of the job, in this era of technology, to start and finish a missile system that will be modern and not obsolete when it is delivered to the using agency.

It follows then, the very limitations on numbers of people which makes a company small business, rule it out as missile-system contractor. By way of illustration, our Bomarc area air defense missile system which is being developed by Boeing Airplane Co., requires a force of 3,800 engineers working entirely on various facets of that missile program. The company is utilizing 700 engineers for the flight-test phase of the program alone. A force of 600 engineers is required to carry out the necessary technical liaison with subcontractors and for base construction planning and surveillance. For this reason, the Air Force has no overall missile-system contracts placed with small business.

On the other hand, small businesses with efficient organizations can, and do, contribute to Air Force missile programs as subcontractors to Air Force missile-system prime contractors, and to major subcontractors under the prime contractor. While the basic responsibility

rests with the prime contractors for decisions to "make or buy," small business participation is strongly urged by the Air Force when the decision is made to buy, rather than to make. In many areas, small business supplies specialized services; products, and components which represent a significant participation and contribution in, and to, our missile development and production programs.

Some items being supplied by small business to missile-system prime contractors at the present time are: frequency converters on a $2,400,000 contract; thermal relays, a $1,200,000 contract; and wiring harnesses and inverter switches, a $2,360,000 contract. These are only three of a long and diversified list of items but it shows, representatively, the contribution from small business and how really significant and vital these items are to our programs.

Although we have followed special arrangements in ballistic-missile programs, which will be covered by General Funk, the ever-increasing demands for higher performance in our weapon systems is causing the Air Force to rely more and more upon contractor-furnished equipment. In previous times, items which the Air Force provided as GFAE (Government-furnished aeronautical equipment) could be procured for application to one or more systems. As a result, it was then to the best interest of the Government to compute aggregate requirements for certain items and provide them from the most economical sources. In the present, and for future time periods, however, to acquire the performance we must build into our systems, it is necessary to develop special purpose vehicles which are optimized for a particular application. The maximum performance inherent in a system design can only be achieved if items making up that system are adapted to, and compatible with, the overall system design. In other words, to maximize a system, we must have parts and components which optimize that system design. For this reason, proportionately more items are now contractor furnished than was previously the case, and it is basically to allow the weapon-system contractor the freedom of design necessary to achieve his system performance commitments.

I would like to assure the committee, however, that to the extent that weapon-system integrity is not jeopardized, we cause procurement of subsystems to be diversified into categories other than contractor furnished. For example, we have taken weapon-system prime contractors' performance-type specifications for certain subsystems and provided such systems to the prime contractor by direct Air Force contract from other sources. Such contracts contain associate agreements which provide a framework within which the prime and associate contractors work together for the necessary exchange of technical information. In this manner, or on the conventional Government-furnished basis, we provide 7 propulsion systems; 1 guidance-nose assembly; and 1 major electronics subsystem to 7 of our non-ballistic-missile systems.

At this point, I would like to treat briefly the matter of negotiated versus advertised bidding. The systems we require today do not lend themselves to advertised procurements. I feel that the process of negotiated procurement is generally misunderstood as being a sole-source procurement. I wish to dispel this conception, and assure the committee, that our negotiated procurements are, in fact, highly competitive. In our negotiated procurements we invite proposals from

as many qualified sources as we can reasonably evaluate prior to the required contract placement date. On major systems under development, as many as 20 major corporations, considered to possess the best qualifications to accomplish the task, are invited to participate in a competitive elimination process, which leads to the eventual selection of a system prime contractor. After the competitive selection of source, contracting is accomplished only with the selected source. However, these are considered, for reporting purposes, as sole-source procurements and are so reflected in the procurement statistics. This process of competition applies to, and extend through, all categories of procurement, be they weapon systems, subsystems, aeronautical equipment, or accessories.

I should say a few words as to the type of contracts the Air Force issues for the procurement of missile systems. In initial phases, because of the many unknowns attendant to the development, the cost-plus-fixed-fee-type contract or cost plus incentive fee is generally utilized. As the program progresses, and the Air Force has a reasonable estimate of the magnitude of the effort and costs related to the venture, we try to shift to contracts with additional incentive features. Incentives are applicable to costs and may additionally encompass timely delivery, performance of the resultant system, or a combination of these.

No study of missile programs is complete without a careful consideration of ground support equipment. This, quite naturally, is the less spectacular portion of a missile system, but its role is vital to the successful firing of a missile, and, some elements of ground support equipment are of a complexity which is equal to any portion of the missile itself. In fact, a missile system should be thought of as being made up of two major elements—the airborne element and the ground based element.

I would like to review briefly some of the functions performed by missile ground support equipment. As you can well appreciate, after launch a missile is strictly on its own. To hit the target, every one of its thousands of parts must function perfectly throughout its flight profile and it must receive the right guidance information during flight or have the right information stored in its memory system immediately prior to launch. None of these prerequisites can be assured without a perfectly functioning and compatible complex of ground support equipment. Test equipment is required to perform extensive analytical checks of missiles in storage, on a periodic basis, to insure they are in a state of potential readiness. In event of alert, the missile must be put in launch readiness immediately. Depending upon the size and type of missile, we may need large launchers erected and tons of rocket fuel pumped under high pressures, all of which call for power units, pumps, lifts, and so forth. Gyros, electronic components, and subsystems of the missile, must be warmed up and checked for proper output, down to the closest of tolerances; guidance elements must be checked and measured and proper commands placed in them; the propulsion system must be checked as well as the power-driven control actuating mechanisms which tie into the guidance package; the warhead and fusing system, which is the payload, must be checked for proper settings, sensitivities, and adherence to the strictest of tolerances. The complete missile system, then must be given this

"go, no go" check in the shortest possible time, in order that our weapons can be immediately responsive to any threat.

Here again, because of the diverse and complex nature of missile ground support equipment, and because of the direct tie-in and complete compatibility required between the airborne and ground elements of the missile system, the Air Force normally procures missile ground support equipment as a part of the basic weapon-system contract with the prime contractor. However, here as in all cases, if the integrity and performance of a system are not at stake and there is no significant advantage to procurement from the prime contractor, the Air Force acquires items of ground support equipment from other sources. By way of illustration, in the case of our surface-to-surface tactical missile, known as the Mace, a number of multipurpose flat-bed trucks were required, which would be so designed as to have a good degree of mobility and possess the capability to house and transport all the necessary power generators and checkout equipment to launch the missile from remote areas. Our procurement people felt just as capable of buying these trucks as the prime contractor. So we developed the necessary specifications with the system prime and associate contractor, and through a competitive negotiated procurement, contracted directly with the Four Wheel Drive Co., Clintonville, Wis., for the units. Initial and follow-on orders amounted to $7½ million and, incidentally, this company was certified as small business on heavy-duty trucks.

Generally, the prime contractors subcontract heavily in the area of ground support equipment, particularly for the large items like launchers, erectors, pipes and tubing, and so forth. For the tactical missile referred to above, we find that 58 percent of the funds for ground support equipment went to sources other than the system contractors, and of that 44.8 percent ended with small business. Many items of ground support equipment are standard or common, and these the Air Force provides as Government-furnished equipment from sources other than the prime contractor. The ground support equipment program is kept under very careful scrutiny by the Air Force to prevent the system prime contractor from developing or supplying an item, when we can provide acceptable items from another source. Provisions of the contract require that weapon-system contractors provide the Air Force with a tentative table of equipment which outlines the ground support equipment for the system concerned at the earliest practicable date. This table of equipment, and all revisions thereto, are carefully screened to ascertain if common Air Force items acquired from other sources can be utilized, modified, or substituted for the requirements stated. Substitutions are made typically in the area of ground power units, oscilloscopes and various electrical gages and checkers, and in handling equipment. For example, I'd like to quote an item recently submitted by the Air Materiel Command in a report to the Air Force Chief of Staff:

(*u*) A year ago each Air Force missile contractor planned to use special materials handling equipment for transporting its missiles. Constant contact with these contractors over the past year, however, has afforded us the opportunity for recommending the replacement of much of this planned equipment with standard USAF equipment. Consequently, over 70 percent of the missile system contractors have changed their methods and now plan to use this standard equipment. For example, nine system contractors have all adopted the rail-trailer system for transporting their missiles and components. This step in the direction

of utilizing common items is expected to result in substantial cost reductions and decreased inventory of USAF transportation equipment.

Insofar as the construction of missile sites is concerned, by interservice agreement, the Corps of Engineers accomplishes this for the Air Force. However, the basic design and layout for the missile system concerned, is accomplished by the weapon-system contractor. It is one of his responsibilities as a weapon-system contractor to present to the Air Force, a recommended base design and layout which will optimize the missile system from an operational standpoint.

I understand your committee is interested in the Air Force method of contracting for detection systems such as DEW line. As you know, the main DEW line system is now in place, with present effort devoted to installation of segments to complete our early warning net.

The DEW line effort was a momentous task carried out across thousands of miles on the fringes of the Arctic. To insure the net was laid down efficiently and in the shortest period of time, the Air Force again resorted to a system prime contractor to develop the system, organize the vast effort required, and to exercise direct management surveillance over the intensive and widespread activities necessary to install the net. The entire project as a package, to include site surveys and construction, was put on contract with the Western Electric Co. In turn then, the prime contractor had to organize a complete composite industry through judicious placement of subcontracts. Subcontractors were selected to provide services such as architecture, construction, and transportation. Equipment and materials acquired through subcontracted sources ran the gauntlet of switchboards, diesel power units, fire alarms, circuit breakers, batteries, radar components, coupling units, ad infinitum. Then, of course, a great amount of required equipment and materials was provided as Government-furnished equipment from the Air Force materiel inventory or from industrial sources responsive directly to Air Force contracts.

I had some reports analyzed in an attempt to provide your committee a feel for the volume of subcontracting involved in the DEW line project. For, as I'm sure you realize, on a program of such magnitude it would be only in the subcontract area that small business could participate effectively.

We find that some $400 million was given to the prime contractor for the project. In turn, the contractor subcontracted $329 million or approximately 80 percent of that dollar volume. All the construction work, amounting to $250 million was subcontracted to construction firms. For electronic equipment Western Electric spent $79 million, of which 31 percent, or $24.8 million, went to small-business firms. For the extensive communication net known as "White Alice" which ties in with the early warning net some $22.5 million was spent by Western Electric for electronic equipment and 45 percent of this (some $10 million) was placed with small business. Finally, in an additional segment to the net small business acquired 55 percent of the purchases which netted an additional $3,327,000. Overall, over 3,600 small-business firms participated.

I would like now to review with you, the statistical information we compiled for your hearing. For this purpose, we selected five nonballistic missile programs in which a measurable degree of hardware production has been experienced. This approach is necessary

in order to provide a realistic basis for evaluation of small-business participation in missile programs. This is true because the full extent and magnitude of the subcontract structure is not fully revealed, or firm, until the weapon system contractor has determined the configuration and requirements of the system production design.

Of the 5 missile programs sampled, only 1, the Falcon, represents a full scale production program. The other programs treated, that is—Bomarc, Mace, Snark, and Rascal, are transitory, in that production is limited, and varies between fabrication of missiles for the test and the manufacture of initial quantities of early production designs.

When the other four affected programs move from engineering shops on to the manufacturing assembly lines, we have every reason to believe that the figures will present a more favorable participation by small business. Nevertheless, summarizing the 5 programs for the time periods sampled, small-business firms received approximately $117 million of some $603 million. This means that the small-business community acquired at least 19.4 percent of the total dollars identified.

The CHAIRMAN. Thank you, General, it is a very fine statement.

Senator THYE. Mr. Chairman, I want to be on record that this was the most interesting and informative statement that we have had.

The CHAIRMAN. Thank you, Senator Thye. I thought it was a very fine and very interesting statement.

Mr. SHARP. Mr. Chairman, we have one more witness to present and this is General Funk in the ballistic missiles area. In the interest of time he has prepared a summary of his statement and would like to show a few charts. With your permission it might be wise to have him give you the summary rather than the lengthy statement.

The CHAIRMAN. I will be glad to do that and let the full statement be presented in the record.

Mr. SHARP. Yes.

The CHAIRMAN. Fine. All right, General Funk.

STATEMENT OF MAJ. GEN. BEN I. FUNK, DEPUTY DIRECTOR BALLISTIC MISSILES, DIRECTORATE OF PROCUREMENT AND PRODUCTION, AIR MATERIEL COMMAND, INGLEWOOD, CALIF.

General FUNK. Mr. Chairman and committee members, first of all, I would like to go into the method of conducting our ballistic missile procurement which relates to our prime manufacturers, our major subcontractors, and small business. Of course your ballistic missile prime contracts at the present time are between the Government and our prime airframe and major subsystem prime contractors. We do, however, stress a requirement to our primes to do the maximum amount of subcontracting in their respective areas. We do this through what we call a make-and-buy procedure. We review what a contractor plans to make in-house in his plant and what he plans to buy outside. The factors that we consider in this make-and-buy review are the additional facilities requests that he might make, the state of the art, of the particular system that he is developing or working on, the difficulties of manufacture in other words, and the availability of in-being facilities. In other words, if a subcontractor, be large or small business, he has certain facilities and certain skills to do these kinds of jobs, we try to insist that our prime go to that

individual instead of building up his own capability. We also consider dual source needs. Sometimes in pushing the state of the art like we do in the ballistic missile program, we find that no one source has enough capability to meet our research and development potential production requirements.

Now, once we have agreed upon a make-or-buy procedure with our primes, this procedure is monitored by our small-business representatives in the area in which the work is to be accomplished. We actually have 45 of these small-business specialists and about 39 offices spread out through our air materiel areas and air procurement districts. In addition to that, I have my own small-business office now out in Inglewood, headed up by Mr. Roy Watkins.

I was given guidance as to what I should cover before the committee. It is covered in general by five major points. These are first of all:

1. The manufacture of missiles.
2. The present and potential opportunities for amall business in missile prime contracting.
3. The present and potential opportunities for small business in missile subcontracting.
4. The activities of the ballistic missile office, my organization, in assisting small business toward realizing its fullest usefulness in the missile field.
5. The present participation of small business in the missile program.

So, let's first look at the manufacture of missiles. Obviously, when we started in the ballistic missile program back in 1954, we found that the capabilities in certain facilities were lacking. We didn't have the type of static testing facilities for testing engines or even a complete missile tied down in configuration.

We didn't have industrial facilities for manufacturing of the guidance systems, nose cone systems, propulsion systems, and, to some degree, airframe facilities. So we began thinking in terms of setting up our test base and our industrial facility base. There were large requirements at some of our test installations for augmenting test facilities there. In being today we have what represents a tremendous potential in an industrial and test facility base in the order of magnitude of about half a billion dollars. The contractor corporate investment runs about $115 million. This is in terms of brick and mortar and nonseverable facilities themselves. The Air Force investment, mostly in the severable area, although some peculiar facility requirements have been built by the Air Force in nonseverable brick and mortar, such as liquid rocket plants, amount to a total of about $185 million. In the public work facility or P–300 series funds, we have augmented our own test bases at Patrick Air Force Base, Edwards, Holloman, and Cape Canaveral by about $115 million. The total was around $450 million.

The significant point here is that industry has participated to a high degree in this base. They have invested about 40 percent of the industrial facilities required in the program which we feel is very good and shows a lot of confidence on the part of industry in supporting this ballistic missile program.

The techniques of building missiles are somewhat different than manned aircraft. This required that we differentiate somewhat

between the facilitization for airplanes and for missiles. For example, we use continuous welding procedures. This has developed a new type of industry in the welding area.

My second point has to do with present and potential opportunities for small business in missile prime contracting. You have heard the other witnesses indicate that in this area due to the difficulties involved, the large engineering staffs required, the new state-of-the-art developments in our particular case, it was not feasible for us to contract directly on a prime basis with a large number of small-business firms. We have, however, made every effort to use small business in specialized areas in support of our ballistic missile program, such as research and study contracts, A. and E. contracts, or architectural and engineering type of contracts, and so on. As a matter of fact, we have one example here I would like to cite to you where the Acoustica Co. up in New York are primed to us for a propellant utilization system on the Atlas missile. They had a peculiar knowledge which we were able to utilize and we contracted directly with them. As a matter of fact, I understand Mr. Rode, the president, has written a letter to Senator Sparkman in this regard.

It has been, of course, then our policy in the ballistic missile division and ballistic missile office to issue contracts directly to our associate contractors in airframes, guidance, propulsion, and nose cones. These contractors are selected as in the proceedings outlined by General Senter. The effort required by these associate contractors is unique so it was not feasible to use advertised procurement. The contracts were negotiated with those selected. It is significant to note that all subsystems are furnished to the airframe contractors as the integrating contractor as Government furnished property. Each contractor then, and there are about 16 hardware producing prime contractors in the ballistic missile program, is a prime contractor. These associate contractors work under the combined management and technical direction of the Air Force Ballistic Missile Division and the Ballistic Missiles Office. The Air Force is supported technically by the space technological laboratories of Ramo-Woolridge Corp.

Mr. STULTS. Might I break in there, General? It seems to me there is a basic split between my concept of a weapon system and what you have been describing where you break out the guidance system, the propulsion system, and nose cone and give contracts for GFE and then furnish that material to the airframe manufacturer who is presumably only an assembler. How does this work into what you and other Air Force witnesses had told us about weapon systems going right down to the launching pad?

General FUNK. Well, you heard General Senter indicate there were unique procedures being used in these ballistic systems program. This is what is unique about it. It was felt by some very high level strategy ballistic missile committees that no one contractor had the technical capabilities of doing the complete weapon-system integration job because we are pioneering so much in the area. Ramo-Wooldridge then was picked as the system's design and technical direction contractor supporting the Air Force.

Mr. STULTS. So, they are really your assistant contractor.

General FUNK. You might say they provide that role to the Air Force, although they are under the Air Force team in Inglewood, under General Schriever.

Mr. STULTS. Since this is an outfit set up from the very beginning by an Air Force contract, as I understand it, is there a great advantage to operating in that way rather than as an Air Force operation and integrated into the Air Force?

Mr. SHARP. Yes, sir. Could I answer that?

Mr. STULTS. Yes.

Mr. SHARP. We have studied this question as Mr. McGuire mentioned among our procurement secretaries and our scientific people very closely. We feel that it is necessary to have somebody manage the system who has a completely objective point of view, who isn't building anything. If he is building anything for the system, he is apt to want to do some of the building in his own plant when maybe somebody else could do it better. This is one of the fallacies of a single weapon contractor. He is apt to do the work himself simply because he knows his own people better and believes in those people. He naturally leans toward those people. In this terrifically complicated program we feel—and this was done long before I arrived in the business, but I do agree with the concept—we had to have some highly technically qualified objective group who could, as contractors, interest the kind of talent they needed, which would come to them which we might not be able to interest to come into the Air Force as a profession but would like to move into some specialized field such as this contractor could afford them. This was the method that was used to get an objective viewpoint and still get the kind of talent we wanted to have assembled. This is a different system. You are exactly right. They are not the same kind of system we have been talking about before this weapon system contracts.

Mr. WEADOCK. But Ramo-Wooldridge has become a producer, isn't that right?

Mr. SHARP. They don't produce anything for the missile system. That is strictly in the contract.

Mr. WEADOCK. Do they produce other items that they contract with the Air Force for?

Mr. SHARP. They are allowed to compete for anything outside the ballistic system but they are not allowed to contract for that.

Mr. STULTS. I am sorry I broke in there, General.

General FUNK. You were right. You picked out an important point there. In effect, we consider no one prime contractor as the weapon-system contractor.

In essence, the Air Force in combination with Ramo-Wooldridge, the Space Technological Laboratories, is the system contractor. We sit together and work together on a daily basis and I would like to describe for you in brief some of the things that Ramo-Wooldridge does under contract and under surveillance of the Air Force team in Inglewood.

They provide solution to interface problems. These are the problems of a weapon system being assembled together and operating as a complete system. They do this role in insuring that all the systems, guidance, nose cone, warhead, and airframe come together and work. This is their job. They also maintain surveillance to insure proper design by these contractors to meet the Air Force requirements. They

establish program milestones for static tests and test firings in order to meet our operational objectives. As indicated by the Secretary, they are prohibited from hardware production in support of the ballistics program where they have technical responsibility. All of their activities are under the surveillance and review and approval of the Air Force.

Mr. WEADOCK. General Funk, let me interrupt you, if I may, sir. Do you, of your own knowledge know what end items that Ramo-Wooldridge produces? Are these things they would sell to General Senter out at the Air Materiel Command? Would they relate to other missiles?

General FUNK. Sir, I think maybe General Senter would be better qualified to answer that. They have contracts to other contracting agencies in the Air Force; for example, Rome Air Force Depot.

Mr. WEADOCK. It is highly unlikely that they would be in the airframe area.

Mr. SHARP. No, sir; they are not in the airframe area. It is mostly in the electronic area and most of it is in connection with other type missiles—not ballistic missiles. Control and warning systems and things of that sort.

Mr. WEADOCK. Yes, I see. Thank you.

General FUNK. Now, I would like to go to my third point, which is the present and potential opportunities for small business in missile subcontracting. In this area, good opportunities do exist for small business to subcontract directly to the prime or indirectly as subcontractors to major subs under the prime. When you consider that there are about 250 principal subcontractors to our 16 hardware producing primes in the ballistic producer program employing some thirty-five to forty thousand people, you will see this provides a good basis from which this kind of subcontracting can be done.

Senator THYE. Mr. Chairman, may I make this inquiry at this point? Does a subcontractor realize as much in his contract as the prime contractor realizes percentagewise? I mean in dollars and cents. Is there any profit taken by the prime contractor on that portion that he sublets? Maybe I don't make myself clear.

General FUNK. Possibly I don't understand you, sir.

Senator THYE. In other words, assuming that a prime contractor has a million dollars in V bid and that he sublets $200,000 of that $1 million. Does he get any proportionate share of that $200,000 that he has sublet? Does he take any percentage as his responsibility in the primary bid and in the transaction that he is subletting?

Mr. SHARP. I think I can answer that, Senator Thye. He does. Yes, sir. He is the system's management contractor and for the purpose of this we consider when we let the contract that he is supposed to subcontract a great deal of this and he gets a fee for the whole job of subcontracting, supervising the subcontracting, and seeing that the subcontract items are properly inspected and fit the whole product when it is put together. For all of this he gets a fee. It is taken into consideration though that he doesn't do the work himself. He gets a fee with this understanding, I think it would be very unwise if we didn't allow him to make a profit on what he subcontracted, if you strictly isolate him and he got nothing. This would make him fight all the time not to subcontract. We feel if he gets a fee for coordinating the whole system, whether he subcontracts or not, it is

much easier for us to influence him to do more subcontracting because it makes no difference to him.

Senator THYE. The only other question there would be, Mr. Secretary, however, if items could be let on a smaller contract as a prime you would save the money and you would then establish the initiativeness on that individual small-business man to endeavor to make the initial bid before you would give him more profit and you would not involve the Government in the subletting and the profit taking in the transactions of subletting. I am thinking about many parts that might not have to be fitted. They are just a coequal part in the general construction; like maybe a switch, or it might be a tube or something of that nature, that is standard equipment once determined, it is it. It just fits into its groove or into its slot and it is that unit. I know that you are studying this question all the time but we do get complaints that too large a percentage go to the prime and that the prime holds life, you might say, over the small operator and that the operator has to come with his hands extended and bow in a certain manner before he comes in and is considered as subcontractor or privileged to join as a subcontractor.

Mr. SHARP. I think, Senator Thye, there is certainly something in what you say. If we could figure out a system in which we, the Air Force, can manage all the procurement of all the, let's say, nuts and bolts which are common items which a systems contractor were to purchase, we could probably save the Government a little money this way. However, it is questionable whether we can, or have the capability in the first place, of setting up an organization that vast. We have so much that we buy now in the Air Force. We have some 1,300,000 items in our catalog and the procurement and the distribution of these things around to the airbases where they are needed, is a task which I am sure General Senter will agree is almost too large to encompass. If we are going to give a systems contractor the responsibility of putting together and testing and making his systems operate, we can't tie his hands too much on exactly what he does with phases of it. If we had unlimited time, if the national defense weren't involved in this matter, I agree with you we should handle it probably in a slightly different manner. In the case of common items—as General Senter pointed out, even in the case of common items in large systems—we take these items back into our Government-furnished equipment category as quickly as we can. Many of the items for the ground handling and ground support of the ballistic missiles are going to be let directly by the Air Force as soon as the design is firmed up; as he mentioned, these trucks that we were talking about. We are trying to get this back into Government-furnished equipment as quickly as the design of the item is frozen and proven to work.

Senator THYE. In other words, Mr. Secretary, you feel you are still in the research stage to a certain extent and therefore you, in some of your prime contracts, are thinking in the terms that they are the best qualified to do this research and that that might be the answer as to why the Air Force probably shows a lesser percentage of small-business participation than you will find in the Army and even in the Navy, because if you look at it percentagewise, I think you level off at about eight plus and as to some of the other branches of the service come a little higher percentagewise than you do.

Mr. SHARP. I hope you are speaking there, sir, of the missile area only.

Senator THYE. Yes.

Mr. SHARP. I think other areas are different. I think you will find when General Funk is able to present his charts, which are very interesting, the fact that even though we are in the research and development area on these big missiles and making so few of them, still it is the little businesses that fit into the picture of making a number of the parts. They have skills to manufacture them, and you will find tremendous percentages of small business subcontracting in this missile area. It is very interesting to see how that has worked out, the subcontracting from the big manufacturers to small manufacturers. I think it is largely because the quantities produced are not of interest to big concerns because they are not mass producible. They have to be made by hand.

Mr. STULTS. Just following through there, Senator Thye and Mr. Chairman——

The CHAIRMAN (interposing). Go ahead.

Mr. STULTS. General Fulton told us the contractor who submitted the best approach to the design problem, let's say he comes in at the beginning, is awarded a contract to develop specifications in such detail that items can be fabricated in exact accordance with the specs. These must be complete in all detail. What General Fulton was saying then is that just as soon as any of these production contracts are firmed up, the Air Force will be able to let prime contracts. You wouldn't have the interface problem or anything else. If you told a man he had to produce a gadget with this configuration and to certain tolerances, presumably then you yourself could go out and, without Ramo-Wooldridge or anybody else, award prime contracts for certain numbers of these end items?

Mr. SHARP. A good example of that, which came up just recently, is our liquid oxygen trailers which we have to have to service these missiles. That was put out on a design competition and one company won the contract to build the first group of trailers, and part of the contract was that we would get detailed specifications and drawings. It is my understanding now that detailed specifications and drawings will be ready on the 1st of May, and if they are, any subsequent procurement made after that will be made on a competitive basis, not on sole source basis.

Mr. STULTS. You would presume that this is the way the Government should also operate when it has financed a research and development contract—that no proprietary rights go thereby to the private business.

Mr. SHARP. I can't see how we could take any other position than that if the taxpayers finance the development, we certainly have the right to procure in the most economical manner.

The CHAIRMAN. All right, General.

General FUNK. We have an Air Force procurement instruction No. 51–103, which indicates that the contractor should do the maximum amount of subcontracting or the prime contractor should. An example how that is being carried out by Douglas is indicative by the fact that 8,473 small-business concerns are supporting the Douglas Thor missile effort. I will go into a little more detail later with some charts I have in this area. These small-business concerns that I

refer to here produce such items as transducers, resistors, trailers, and so forth. Also, our air materiel areas and air procurement districts in the Air Materiel Command are actively engaged in apprising small business on how they might fit into the ballistic-missile program, particularly since the ballistic-missile program is becoming more widely known throughout the industry and to the public. An example here is the Ogden air materiel area meeting to be held in Casper, Wyo., in May. Our people from the ballistic-missile office in Inglewood will participate in this meeting. I would like to go to my fourth point, which is the activities of the ballistic-missile office in assisting the small business toward realizing its fullest usefulness in the missile field.

We, of course, all recognize, I think, during the early stages of the research and development program there was little interest shown by major subcontractors and even small business to directly participate in the ballistics program. I think this is primarily due to the fact that the program was highly classified back in 1954, 1955, and 1956. Also, the hardware was very much in the developmental stage then and therefore little effort was expended on production or indicating a potential toward production. Third, the major subcontractors and small-business concerns were being utilized by major primes in meeting our then current manned aircraft and missile programs which were going a little more full scale at that point than they are today. However, as a result of some of the stretchouts in our manned aircraft programs, some of the primes, major subcontractors, and small business that were participating in manned aircraft programs are beginning to express and began to express back in 1957 a great interest in the ballistic missile program because at the same time that these stretchouts were occurring, the ballistic-missile program gained emphasis, particularly after the Sputniks I and II. So, in response to contractor interest which was generated in the ballistic-missile program in May of 1957, I set up in my organization and in General Schriever's organization an office for receiving inquiries both written and oral from contractors, both large and small, desirous of participating in the ballistic-missile program. Our small-business office today in Inglewood entertains daily visits from all segments of industry, both large and small. For example, during March of this year we had 77 different firms contact this office and of this number 44 were small-business concerns. I have a chart that I will show you later which shows the rapid increase in visits to our management complex in Inglewood. As a part of our briefing to these contractor visitors we provide them with a current list of our prime contractors, a current list of our subcontractors, and in addition to the service I provide, the small-business specialist I referred to before in each respective area, also apprise large and small business of this particular service.

Now, indicative too of the stress that the ballistics-missile office places on broadening our subcontract and small-business base, a letter that I sent to all prime contractors on the 28th of February this year (see exhibit 6, p. 94) indicated that due consideration should be given to these resources, these potential resources of small business prior to our office approving additional requests of our primes for more resource support in the way of facilities or increased manpower or things of this kind which may come about as a result of some of the accelerations now going on in the ballistic missile program.

I mentioned earlier the Air Force requirement for this "make and buy" which we have also published as an internal regulation and just exactly how we will go about implementing this "make and buy" procedure in the ballistic-missile office. I have requested our Air Force plant representatives and air procurement districts to put increasing emphasis on small-business participation and the utilization of small-business concerns in the subcontracting areas.

Another thing that we have stressed over the past year in several speeches that I have made to potential subcontractors, among whom a lot of small businesses have been represented, is the fact that due to reductions in manned aircraft programs where they have been orienting their efforts, to reorient their efforts now to ballistic-missile programs. We are anxious to use their capabilities in support of our program. For example, on March 19, 1958, I personally spoke to the San Fernando Valley Chamber of Commerce in Northridge, Calif. This conference was attended by approximately 800 people representing approximately 250 small-business concerns. My people and I are continuing this sort of communication with potential small-business industries.

My fifth point and last point has to do with the present participation of small business in the missile program. We currently enjoy a 21 percent participation by small business in the ballistic program as a cumulative average since the inception of the program.

Mr. WEADOCK. Is that percentage of prime contracts?

General FUNK. No, sir; subcontracts. Very few are primes. We have identified some of the second-tier subcontractors and my charts will illustrate that in just one moment.

Through December 31 our invoices by our primes represent about $1.3 billion and of this amount, $269 million on first-tier subcontract basis went to small business. We consider this a very healthy situation at this stage of the game. We are still far from being in the major production stages as yet. (Chart 1.)

I would like now, if I may, to go to my graphics which I think will illustrate participation by some of our major primes with small business as a first-tier subcontractor.

Mr. WEADOCK. Surely.

General FUNK. As indicated earlier, distribution placed by our prime contractors to small business represents $269 million or 21 percent of the $1.3 billion invoiced through December 31, 1957. These had to do with the Atlas program, the Titan program, and the Thor program. The distribution of dollars paid to small business by weapons systems is shown by this pie chart. (Chart 2.)

Forty-six percent of those dollars went to the Atlas small-business subcontractors or about $123 million. Thirty-seven percent went to the Titan program, or about $98 million. Seventeen percent went to the Thor program or about $43 million.

Mr. WEADOCK. Who is the Thor prime contractor?

General FUNK. Douglas Aircraft. This is Douglas Aircraft, Convair on the Atlas and Martin on the Titan.

Let's look at Douglas Aircraft. (Chart 3.)

CHART 1

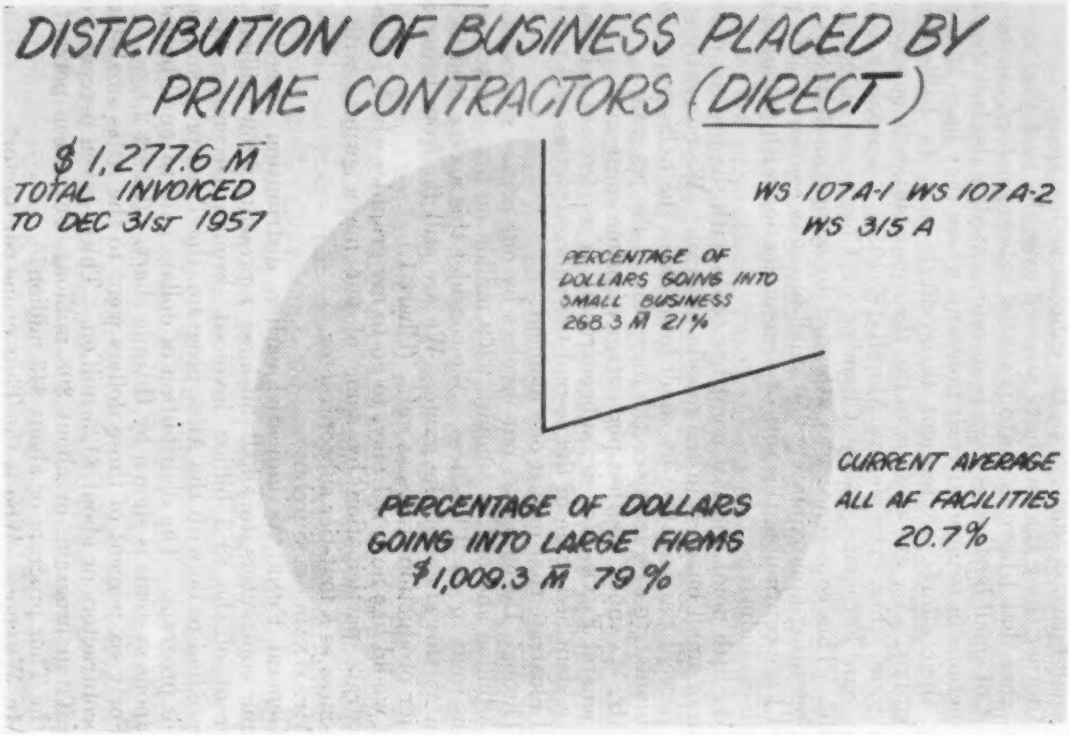

DISTRIBUTION OF BUSINESS PLACED BY PRIME CONTRACTORS (DIRECT)
$1,277.6 M
TOTAL INVOICED
TO DEC 31st 1957
WS 107A-1 WS 107A-2
WS 315 A
PERCENTAGE OF DOLLARS GOING INTO SMALL BUSINESS
268.3 M 21%
CURRENT AVERAGE
ALL AF FACILITIES
20.7%
PERCENTAGE OF DOLLARS
GOING INTO LARGE FIRMS
$1,009.3 M 79%

CHART 2

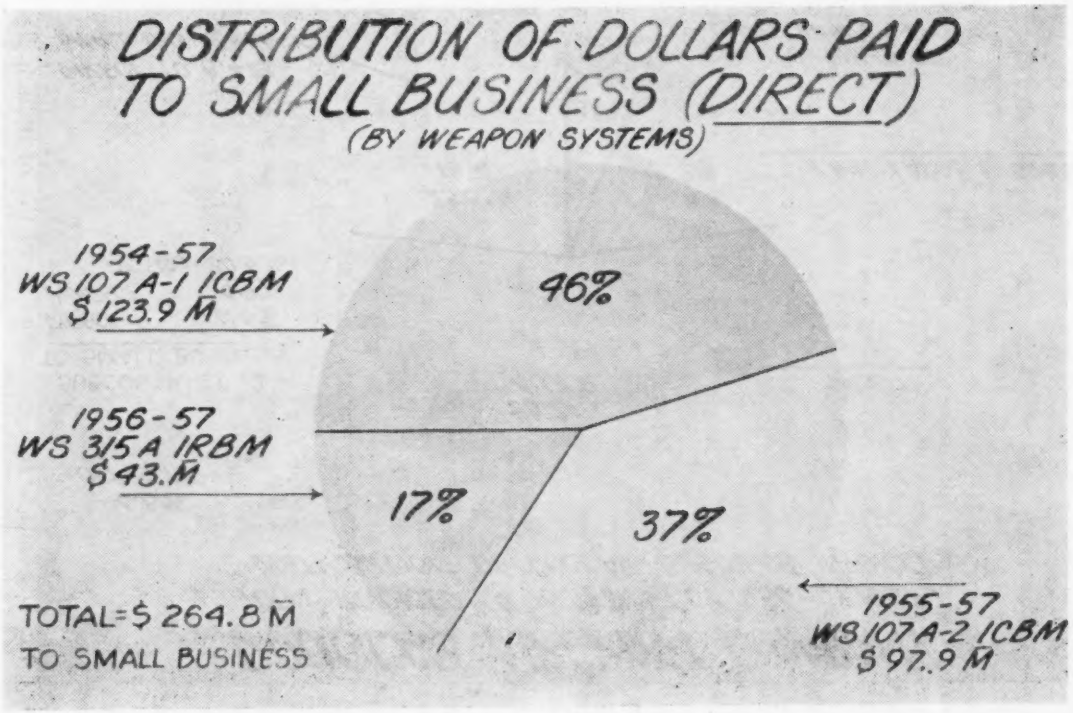
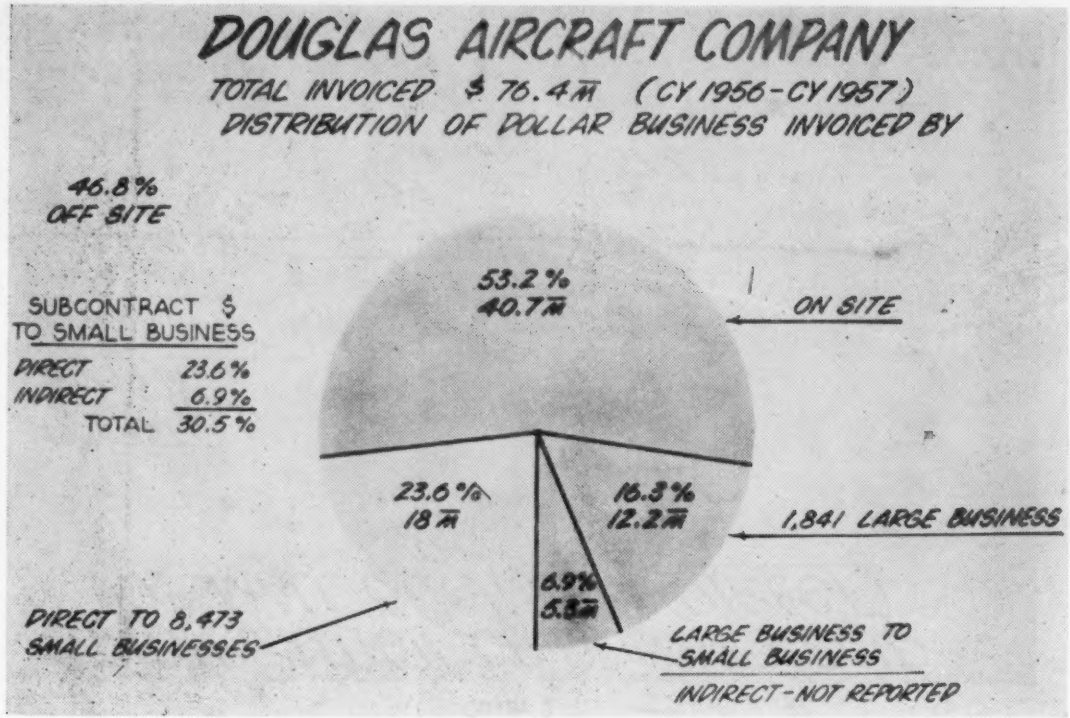

DISTRIBUTION OF DOLLARS PAID TO SMALL BUSINESS (DIRECT)
(BY WEAPON SYSTEMS)
1954-57
WS 107 A-1 ICBM
$ 123.9 M
46%
1956-57
WS 315 A IRBM
$ 43. M
17%
37%
1955-57
WS 107 A-2 ICBM
$ 97.9 M
TOTAL=$ 264.8 M
TO SMALL BUSINESS

CHART 3


DOUGLAS AIRCRAFT COMPANY
TOTAL INVOICED $ 76.4 M (CY 1956 - CY 1957)
DISTRIBUTION OF DOLLAR BUSINESS INVOICED BY
46.8% OFF SITE
SUBCONTRACT $ TO SMALL BUSINESS
DIRECT 23.6%
INDIRECT 6.9%
TOTAL 30.5%
53.2% 40.7 M
ON SITE
23.6% 18 M
16.3% 12.2 M
1,841 LARGE BUSINESS
6.9% 5.2 M
DIRECT TO 8,473 SMALL BUSINESSES
LARGE BUSINESS TO SMALL BUSINESS
INDIRECT - NOT REPORTED

Total invoices $76.4 million in the period 1956 and 1957. This is the work Douglas does on site. This is what we call the make, 53.2 percent of the work or $40.7 million went to them. Of that he subcontracted to large business 16.3 percent or $12.2 million to 1,841 large-business concerns. These large businesses subcontracted in turn and we have been able to identify 6.9 percent of the business or $5.3 million to small business. Then direct to 8,473 small businesses, 23.6 percent or $18 million.

Mr. STULTS. General, before you flip that chart over, so we are sure you are not kidding us. Of that 23.6 percent that goes direct to small business, you must take out a slice. If you are going to add going down a second tier, you should also subtract from the first tier what small business must buy from large business; is that not correct?

General FUNK. That possibly would be true. However, what we are trying to identify here is what the Douglas Co. has subcontracted directly to small business, don't you see?

Mr. STULTS. Yes; that is right. But by adding that 6.9 percent, you are giving perhaps a somewhat erroneous impression. Let us assume that the 27.6 percent goes to small business. They have to buy aluminum. They buy that from Reynolds, Kaiser, or Alcoa. You ought to take a little slice off there. They have to buy from Anaconda, that ought to be sliced off. They have to buy electrical machinery, they buy from Westinghouse, that should be sliced out. While I appreciate the 6.9 percent might be added on, we better not count on it too heavily.

Mr. SHARP. We shouldn't count on it too heavily but it does indicate the participation. At least small business gets in even though they have to buy steel from a big steel company, they still have to fabricate it.

Mr. STULTS. The reason I jumped on that is this: A couple years ago one of the services said small business gets 20 percent at the prime-contract stages and 20 percent at the subcontract stages and therefore they are getting 40 percent of the defense dollar. Well, this isn't right. It would be just as logical to say that big business is getting 80 percent of the prime contracts and big business is getting 80 percent of the subcontracts and therefore big business is getting 160 percent of the contract dollar. That would be a neat trick.

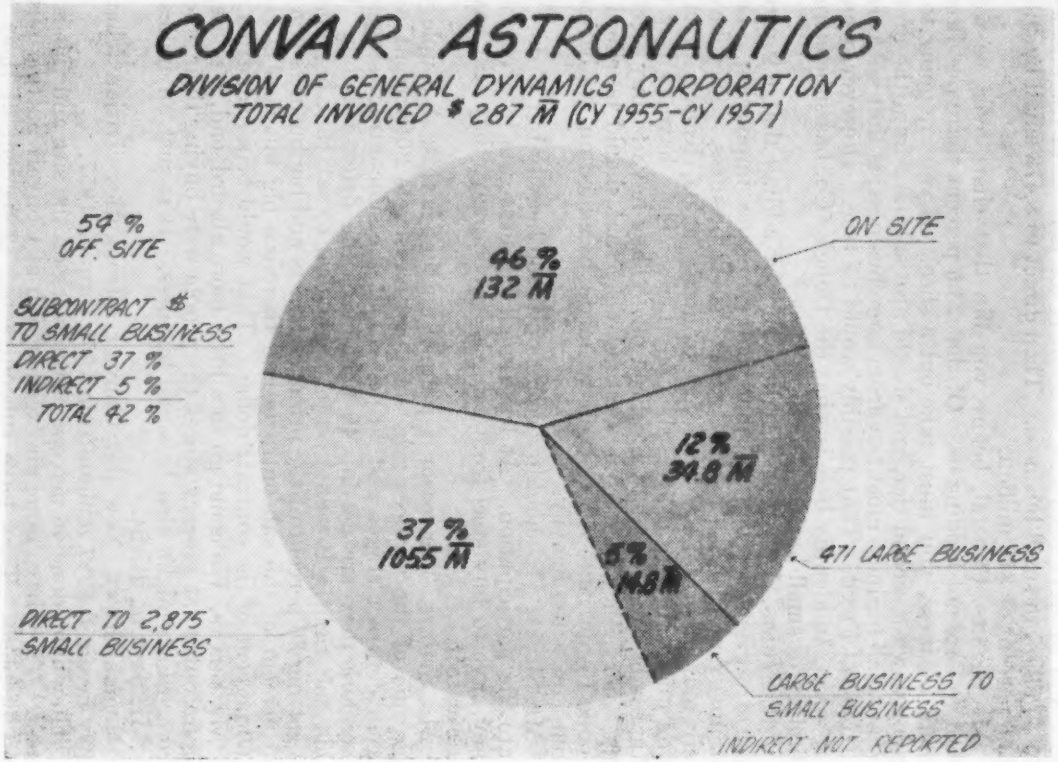
Mr. SHARP. We could go to a little more absurd end, I guess, and figure out what grocery stores the people were buying their groceries from, which might also be small business. It is just an indication.

Mr. STULTS. Right.

General FUNK. Now this Convair astronautics division (chart 4), they invoiced $287 million from 1955 through 1957.

They have done 46 percent of the work on the site and this is very good. They have done an excellent job at Convair putting business out of plant. They have subcontracted 12 percent of their work, or $34.8 million to 471 large businesses and of that amount 5 percent went on down to small business. Thirty seven percent of these dollars or $105½ million went directly to 2,875 small businesses. Fifty-four percent of the work was offsite. Of this amount small business received direct 37 percent, and indirect 5 percent, or 42 percent of the business.

CHART 4


CONVAIR ASTRONAUTICS
DIVISION OF GENERAL DYNAMICS CORPORATION
TOTAL INVOICED $ 287 M (CY 1955-CY 1957)
54 %
OFF SITE
SUBCONTRACT $
TO SMALL BUSINESS
DIRECT 37 %
INDIRECT 5 %
TOTAL 42 %
46 %
132 M
ON SITE
12 %
34.8 M
471 LARGE BUSINESS
37 %
105.5 M
DIRECT TO 2,875
SMALL BUSINESS
5 %
14.8 M
LARGE BUSINESS TO
SMALL BUSINESS
INDIRECT NOT REPORTED

Now we come to the Martin Co. which produced the ICBM Titan. They invoiced $128.3 million in 1956 and 1957. Forty-seven percent on site; 18 percent to 403 large businesses, and 27 percent going to small business. In addition 8 percent or $10 million went to small business from subcontractors. Twenty-seven percent or $34.9 million went directly to small businesses from the Martin Co., to 1,517 various companies. (Chart 4 (a).)

Now we go to Rocketdyne, a division of the North American Corp. (chart 5).

It invoiced $226 million, 1955 through 1957. We must recognize we are really pushing the state-of-the-art with this liquid rocket engine. North American is doing a lot of work in house because of technical reasons.

Mr. SHARP. I might add there when you speak of "in house" as I understand it, you also mean running test facilities and test standards which they have to do themselves and following the missiles at Cape Carnaval. It really isn't in house at their own plant but a lot of this effort goes into carrying out the test on these things and right now on these missile engines the testing is a very large proportion of the work done in their own testing sites furnished by the Government out there.

General FUNK. Nevertheless, 9.5 percent or $21 million went to 851 large-business contractors and 3.5 percent or $8 million to small business from subcontractors and 20 percent or $45 million to small business direct to 4,036 firms. Thirty-three percent of the work was offsite. I think one of the most interesting charts of all is identifying how large was the small business to which the North American work went (chart 6).

Looking at the small business employing zero to 49 employees, 39.3 percent or $30 million dollars going to small business went to zero to 49 employees type activity. The number of the subcontractors being 2,539. Small business from 50 to 199 employees, a lesser amount of this work, 21.8 percent, or $16.6 million to 1,228 firms. It seems as though the bigger small business gets, the less work they get from North American. The small business, 200 to 499 employees, 5.5 percent or $42 million to 469 firms. These people are, of course, competing with large business. The large business subcontracting area got 33.3 percent of the work and $25.2 million.

Mr. SHARP. I think there is an interesting point there that small little pie which you point out is between, I don't quite read the number——

Mr. WEADOCK. 200 to 499.

Mr. SHARP. What happens there so often as soon as they get a subcontract they immediately move over in the big-business area. I am sure that is one of the reasons it stayed small because they are close to the line anyway.

Mr. WEADOCK. We don't have many complaints from them after that happens.

General FUNK. I make this point that small business from subcontracting to North American got $50.8 million or 66 percent for 4,046 subcontractors, while large business subcontractors got $25.2 million, or 33.3 percent for 851 subcontractors.

CHART 4 (a)

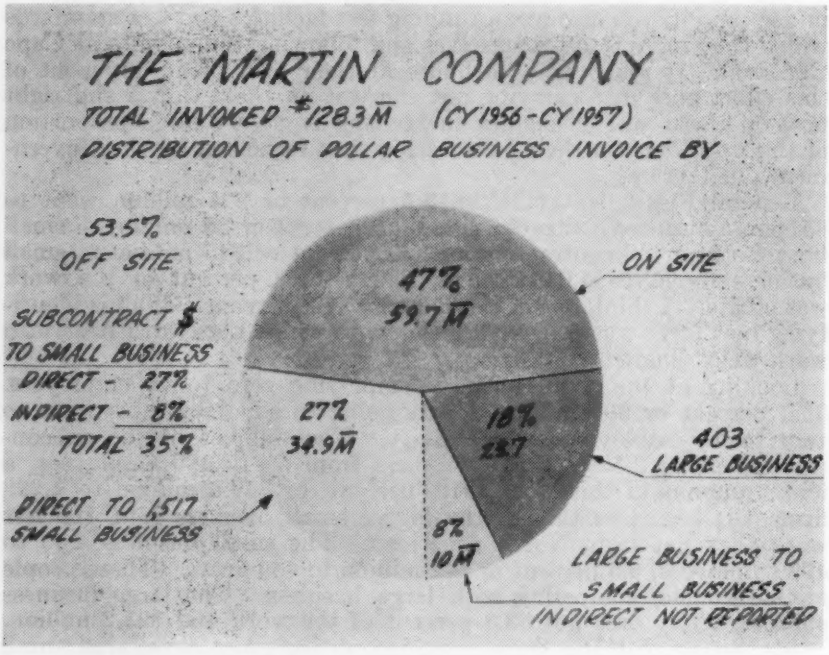

THE MARTIN COMPANY
TOTAL INVOICED $128.3M (CY 1956 - CY 1957)
DISTRIBUTION OF DOLLAR BUSINESS INVOICE BY
53.5%
OFF SITE
SUBCONTRACT $
TO SMALL BUSINESS
DIRECT - 27%
INDIRECT - 8%
TOTAL 35%
DIRECT TO 1,517
SMALL BUSINESS
47%
59.7M
ON SITE
27%
34.9M
18%
22.7
403
LARGE BUSINESS
8%
10M
LARGE BUSINESS TO
SMALL BUSINESS
INDIRECT NOT REPORTED

CHART 5

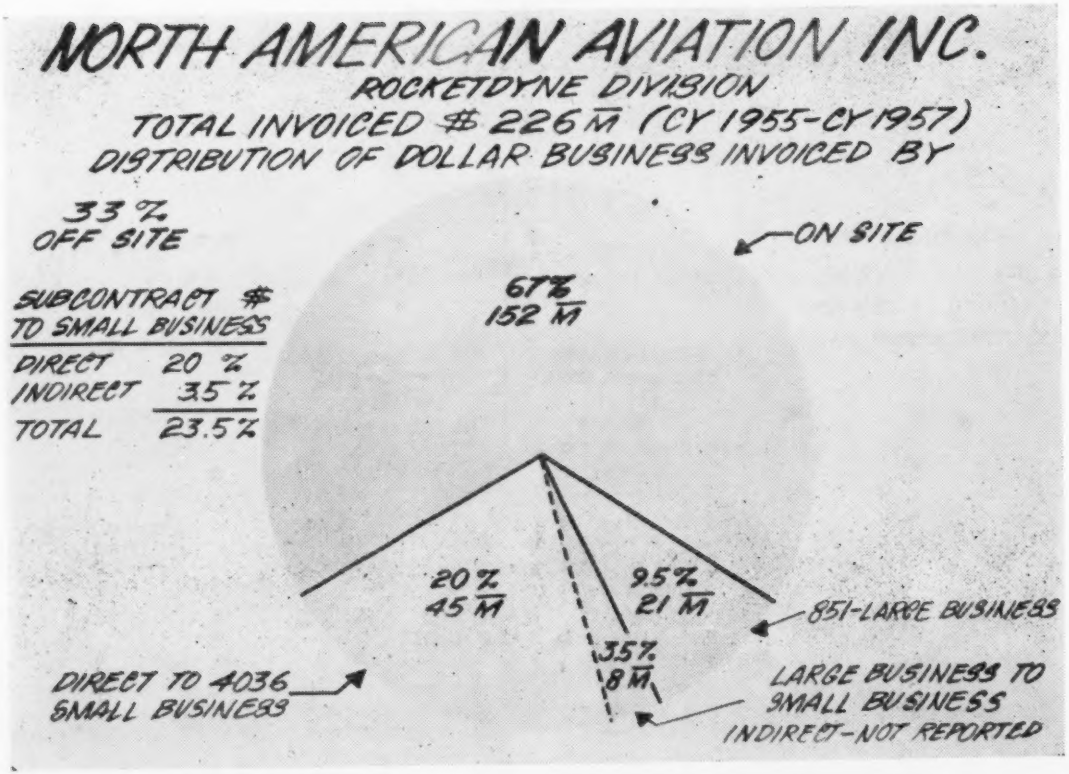
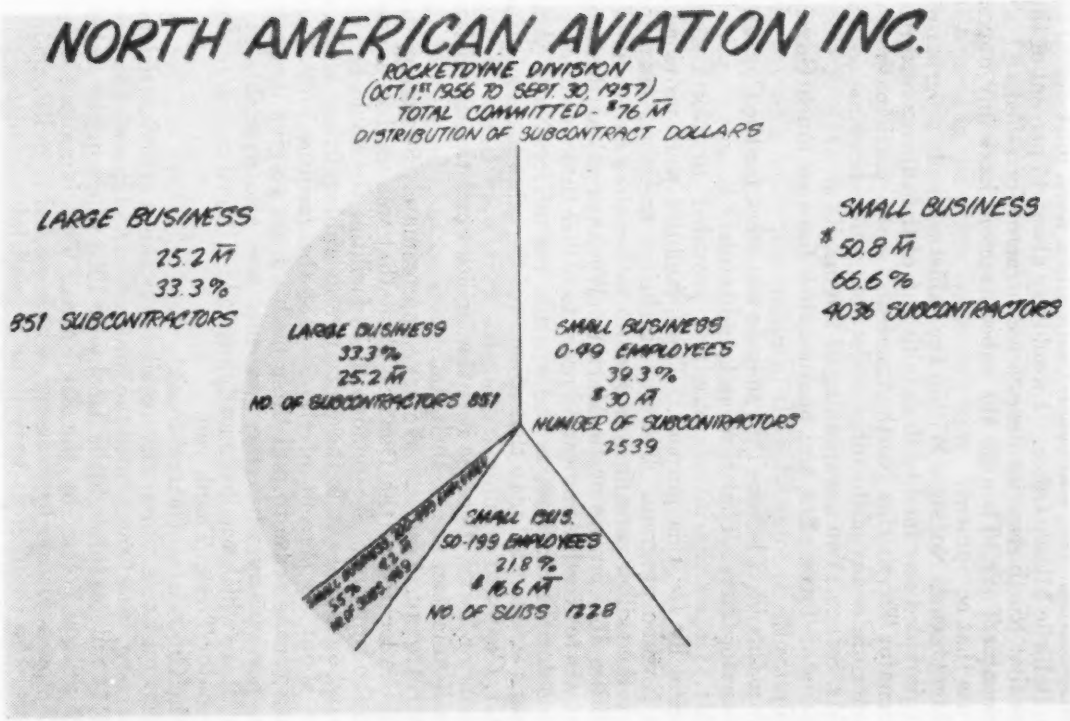

NORTH AMERICAN AVIATION INC.
ROCKETDYNE DIVISION
TOTAL INVOICED $ 226 M (CY 1955-CY 1957)
DISTRIBUTION OF DOLLAR BUSINESS INVOICED BY
33 %
OFF SITE
ON SITE
67 %
152 M
SUBCONTRACT $
TO SMALL BUSINESS
DIRECT 20 %
INDIRECT 35 %
TOTAL 23.5%
20 %
45 M
9.5%
21 M
851-LARGE BUSINESS
35%
8 M
DIRECT TO 4036
SMALL BUSINESS
LARGE BUSINESS TO
SMALL BUSINESS
INDIRECT-NOT REPORTED

CHART 6


NORTH AMERICAN AVIATION INC.
ROCKETDYNE DIVISION
(OCT. 1ST 1956 TO SEPT. 30, 1957)
TOTAL COMMITTED - $76 MM
DISTRIBUTION OF SUBCONTRACT DOLLARS
LARGE BUSINESS
25.2 MM
33.3%
851 SUBCONTRACTORS
SMALL BUSINESS
$ 50.8 MM
66.6%
4036 SUBCONTRACTORS
LARGE BUSINESS
33.3%
25.2 MM
NO. OF SUBCONTRACTORS 851
SMALL BUSINESS
0-99 EMPLOYEES
39.3%
$ 30 MM
NUMBER OF SUBCONTRACTORS
2539
SMALL BUS.
50-199 EMPLOYEES
21.8%
$ 16.6 MM
NO. OF SUBS 1228

Senator THYE. General, what percent of the equipment used by North American is Government-owned equipment, such as tools and dies?

General FUNK. Jack, would you have that figure offhand?

Mr. CLARK. I don't have the exact figure.

Mr. STULTS. Excuse me, could you identify yourself.

Mr. CLARK. Yes; I am Jack Clark and I work for General Funk in the Ballistic Missile Office. I would say about 45 percent of the facilities that North American uses are contractor furnished.

Senator THYE. Then do the subcontractors have any opportunity to use that equipment?

Mr. CLARK. No, sir. Within the ballistic-missile program we have not provided any facility to date to any of the subcontractors.

Senator THYE. Has North American been a participating subcontractor under any of the other major contractors or prime contractors?

Mr. SHARP. You are speaking of the missile area?

Senator THYE. Yes, sir; because they have so much Government equipment.

Mr. CLARK. I believe that they do test work for the Convair Corp.

Senator THYE. That is what I understood.

Mr. CLARK. Facilities were not provided to North American specifically for this purpose. These facilities were provided under the Navaho program. They are in being, and the contractor does have the skilled personnel to operate rather than to provide further facilities to Convair or to Martin. We have asked them to subcontract to North American in order to utilize these facilities.

Senator THYE. That is the specific reason for North American being a subcontractor to that of some of the other firms as prime?

Mr. CLARK. Yes, sir.

Senator THYE. Because it is the facilities and the technicians that North American has on their staff.

Mr. CLARK. Yes, sir. We have approximately $4 million worth of facilities located at the Downey plant that was used to support the Navaho program. To remove these facilities we would leave in the ground or in holes or in the walls, nonseverable portions which represent about 80 percent of the cost of the facilities. Obviously, it doesn't make sense to pull these facilities out to give them to some one, particularly when the personnel was also available at North American, which was technically needed.

Senator THYE. Thank you.

The CHAIRMAN. General Funk.

General FUNK. You may recall in speaking of industrial facilities alone now, that I mentioned the contractors had invested to the extent of $114 million through the fiscal year 1958 as compared to less than $200 million dollars by the Air Force. This is around 40 percent of the participation by industry, which we feel is quite good. Thus we feel the contractors have done a good job of putting their own money into facilities for the balistics program.

Mr. SHARP. I might say in connection with the facilities in the industrial faciltizing area, I personally pass on all the industrial facilities which we furnish to contractors and I am personally making an extremely strenuous effort to reduce the amount of facilities furnished by the Government on the theory that with the kind of produc-

tion that we are making now, the kinds of items we are buying now, there must be facilities somewhere in existence that can do the job. The only places that we are putting in facilities of any substantial amount at all are areas largely of test facilities where they have to have test standards and things of this kind which are highly specialized and nobody would have anywhere else. These are the only kind of things that I am approving now in the way of Government-furnished equipment.

Senator THYE. Mr. Secretary, there is just one question in connection with that. Do you charge a rental for the use of the equipment or is that figured in the prime contractor bid.

Mr. SHARP. No, sir; we don't charge rental for Government-furnished equipment unless it is being used for commercial production. I mean we have, for instance, on some of our heavy press programs, the companies that are operating the heavy press programs are not only making items for the armed services but they are also making items which they sell commercially and when they are doing that, they pay us a fee or percentage of the sales price or an average of the tonnage involved. We are considering with the Department of Defense an arrangement where the contractors will pay rent on everything that they have. To be perfectly frank, I don't know of any other way to equalize the situation. It would build up a terrific amount of bookkeeping and a terrific system of surveillance since, of course, we must have some way of retrieving this money. In many cases we would be paying the contractor an extra fee if it is a cost-plus-fixed-fee contract. We would be paying him a larger cost and then getting it back. But under the present rules this money would go directly to the Treasury, and it would come out of our procurement funds, and it would be a very substantial amount of money. It would reduce the amount of money appropriated to us by that amount, and we would not be able to use it for hardware because we would be spending it in this peculiar process of charging rent on something and paying the rent ourselves. We are, however, studying this and trying to work out an arrangement. I personally think the best answer is probably to follow this across the board rental process even though it may be cumbersome.

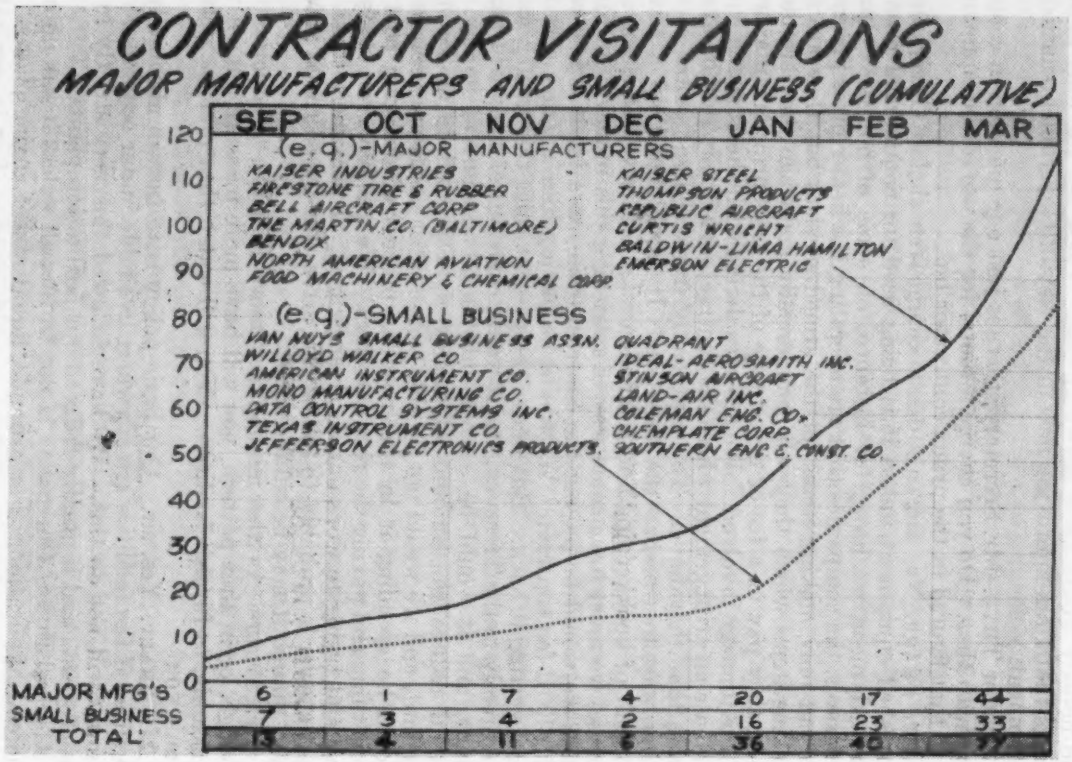
Mr. STULTS. As the missiles get more into the production end though, or in that pattern, you will have more pressure put on you, I assume, to furnish facilities. You will watch that pretty carefully, won't you?

Mr. SHARP. Yes, sir. Our basic policy is to furnish absolutely no facilities if the facilities are anywhere available in our economy. We simply will not do this. We have followed this very strictly in the last 2 years, and it greatly reduced our facilitation plants.

General FUNK. Our policy is not to furnish unless it has no commercial application. For example, liquid rocket engine plants. We have constructed some of these in this program, but in general we only furnish equipment in the specialized machine tool and test equipment category to our contractors. I have only one more chart (No. 7) which just indicates contractor visitations to my small-business office going back in the time period from September through March. You can see the interest and growth of visitations.

25108—58——7

CHART 7


CONTRACTOR VISITATIONS
MAJOR MANUFACTURERS AND SMALL BUSINESS (CUMULATIVE)
SEP
OCT
NOV
DEC
JAN
FEB
MAR
120
110
100
90
80
70
60
50
40
30
20
10
0
(e.g.)-MAJOR MANUFACTURERS
KAISER INDUSTRIES
FIRESTONE TIRE & RUBBER
BELL AIRCRAFT CORP.
THE MARTIN CO. (BALTIMORE)
BENDIX
NORTH AMERICAN AVIATION
FOOD MACHINERY & CHEMICAL CORP.
KAISER STEEL
THOMPSON PRODUCTS
REPUBLIC AIRCRAFT
CURTIS WRIGHT
BALDWIN-LIMA HAMILTON
EMERSON ELECTRIC
(e.g.)-SMALL BUSINESS
VAN NUYS SMALL BUSINESS ASS'N.
WILLOYD WALKER CO.
AMERICAN INSTRUMENT CO.
MONO MANUFACTURING CO.
DATA CONTROL SYSTEMS INC.
TEXAS INSTRUMENT CO.
JEFFERSON ELECTRONICS PRODUCTS.
QUADRANT
IDEAL-AEROSMITH INC.
STINSON AIRCRAFT
LAND-AIR INC.
COLEMAN ENG. CO.
CHEMPLATE CORP.
SOUTHERN ENG. & CONST. CO.
MAJOR MFG'S
SMALL BUSINESS
TOTAL
6 1 7 4 20 17 44
7 3 4 2 16 23 33
13 4 11 6 36 40 77

A total of 77 visitors came to Inglewood in March. Of those, 44 were big business and 33 were small business. That is going up all the time, and these are some of the small manufacturers in small business. Just to give you an idea of the type of people that come to see us. That is all I have, gentlemen.

The CHAIRMAN. Thank you, General, and all of you gentlemen.

(The full prepared statement of Major General Funk, with accompanying exhibit follows:)

PREPARED STATEMENT OF MAJ. GEN. BEN I. FUNK, DEPUTY DIRECTOR, BALLISTIC MISSILES, DIRECTORATE OF PROCUREMENT AND PRODUCTION, AIR MATERIEL COMMAND, INGLEWOOD, CALIF., WITH ACCOMPANYING EXHIBITS

Mr. Chairman and committee members, I would like to explain to you the method of conducting ballistic missiles procurement as it relates to prime manufacturers, major subcontractors, and small business. As you have undoubtedly already concluded, from the material furnished by my office in response to Senator Smathers' letter dated February 28, 1958, contracts as reflected therein for ballistic missiles hardware are between the Government and prime contractors having complete responsibility for major systems of each of the ballistic missile programs. However, in negotiating contracts between the Government and prime contractors, as mentioned previously, every effort is made to reach an agreement with the prime for maximum subcontracting in fulfilling his obligations under his contract with the Government.

That portion of the overall ballistic missile business which is subcontracted both to major subcontractors and small business is controlled by a review of the prime contractor's make-and-buy structure which portrays those items to be produced on-site versus those items which are to be produced off site. In the event the make-and-buy structure as submitted by the prime contractor is not acceptable to the contracting officer, further negotiations are conducted in order that an agreeable and realistic make-and-buy structure may be concluded.

Various factors of consideration are used in negotiating a make-and-buy structure with the participating prime contractors. Some of these factors are: To what extent is the prime contractor requesting additional industrial resources facilitation (brick and mortar, machine tool and laboratory and test equipment); the state of the art on a particular system and/or components being procured; the availability of in-being facilities, including technically skilled personnel; dual source considerations; availability of sound engineering; startup cost; unit cost; delivery performance; and other considerations which may be pertinent at the time of the negotiation.

Once the make-and-buy structure has been agreed upon it is incumbent upon the prime contractor to carry out the Air Force policy as relates to small business in contracting with the concerns as approved within the make-and-buy structure. This effort is monitored by the small-business representative as assigned within the area wherein the work is being accomplished.

In addition to the monitorship by the small-business representative in each of the respective areas wherein our participating primes reside, I have established a small-business office within the BMO which reports directly to me.

I believe the foregoing somewhat in general begins to put in focus the relationship between the Government and industry with respect to Air Force ballistic-missiles procurement. Therefore, I would like to continue this discussion specifically pointed to the following five major points of consideration:

(*a*) The manufacture of missiles.

(*b*) The present and potential opportunities for small business in missile prime contracting.

(*c*) The present and potential opportunities for small business in missile subcontracting.

(*d*) The activities of BMO in assisting small business toward realizing its fullest usefulness in the missile field.

(*e*) Present participation of small business in the missile program.

Since the inception of the ballistic-missile program, an industrial facilities base has been created for the manufacture of missiles as required to support the research and development program, keeping in mind at the same time that directives would be forthcoming outlining an additional requirement to produce ballistic missiles for operational forces at the earliest possible date.

This concept of conducting a research and development program simultaneously with low-volume production of research and development articles for the test program dictated the creation of an industrial base composed of high-quality tooling, precision-type machine tools, laboratory and test equipment during the early facilitation of the participating prime contractors. This industrial base is essentially in being at this time and is currently being augmented to meet the requirements for the production of our operational forces.

This resources base represents an overall investment of approximately $450 million. This total cost is broken down into three major elements.

(1) The book value of facilities, both severable and nonserverable (machine tools, lab equipment, and brick and mortar), as furnished by the participating prime contractors, through the use of corporate funds, represents an investment of $115 million.

(2) Industrial facilities funds (P–150 series) in the amount of $185 million was expended for machine tools and laboratory and test equipment, in addition to special environmental and backyard test facilities (Government-owned land) at the contractor's plants.

(3) Public works funds (P–300 series) in the amount of $150 million was expended for the construction of test facilities (test stands, receiving building, labs, et cetera) located at Air Force test centers such as Edwards, Holloman, and Cape Canaveral.

In manufacturing and assembling a missile such as the Atlas, the techniques used are not conventional to that of manufacturing and assembling manned aircraft such as F–100 series Century fighters and/or bombers of the B–52/B–58 types. The major Atlas airframe itself, which consists of major components, is welded together on a continuous assembly-line basis utilizing spot- or rolled-seam welding techniques versus the assembly of major components of manned aircraft such as the forward fuselage, midfuselage, aftfuselage, wings, and empennage, which are bolted together at their mating points, due to interchangeability requirements of these major sections.

I would now like to discuss the second point which makes reference to present and potential opportunities for small business in missile prime contracting. As mentioned and explained previously, the nature of conducting a very large, high-priority development program with a concept for early availability of operational missiles does not lend itself to direct prime contracting with a large number of small-business firms for the weapon system itself. We have, however, specific contracts with certain small-business concerns in some cases for work in specialized areas. These include research and study contracts, architectural and engineering design, and development and fabrication of some hardware. The largest single example of a major prime contract with small business is one which was recently placed with Acoustica Associates, Inc., for development and manufacture of propellant utilization systems. This is a multimillion dollar procurement—$4,048,902.

It has been the policy in contracting for research and development and production on the ballistic missiles program to issue contracts to associate contractors, each being responsible for a component part of the weapon system, i. e., airframe, guidance system, propulsion system and nose cone. These contractors have been selected after a review by a source selection board composed of the most experienced people we have who evaluate potential sources on the basis of their demonstrated technical ability and production record. None of the major prime contractors on the ballistic missiles program were selected on the basis of proprietary rights. Contracts which have been awarded on the ballistic missiles program to date have been for effort which was unlike any other heretofore attempted; therefore, they did not lend themselves to advertised procurements. Competition was accomplished by the review of the source selection board and upon a selection the procurement was negotiated with the individual contractor selected. All component parts are being procured from this group of associate contractors under prime Air Force contracts. Such components are furnished as subsystems to the airframe contractor as Government-furnished property for assembly into the weapon system.

Under the associate contractor approach used on the ballistic-missiles program, a team of contractors has been established for each weapon system. Each is prime contractor to the Air Force and each produces a subsystem in terms of airframe, propulsion, nose cone, and guidance. These associated contractors work under the combined management and technical direction of the Air Force Ballistic Missiles Division (ARDC), and the Ballistic Missiles Office (AMC). The airframe contractor, in addition to producing the airframe system, has the responsibility for assembling the missile from subsystems furnished to him as

Government-furnished property. Under this integrated team concept no one contractor is, in reality, the prime weapon system contractor.

The contract structure for the ballistic missile program is different from that normally used in developing a weapon system. In other programs the Air Force has contracted with a prime contractor for the overall weapon system development, who normally becomes the major manufacturer on the program. However, on the ballistic-missiles program a different approach has been taken. The Space Technology Laboratories, a division of the Ramo-Wooldridge Corp., has been given responsibility for the systems engineering and technical direction of the three ballistic missiles weapon systems. Under their contract with the Air Force, STL will:

(*a*) provide the solution to interface problems on the weapon systems and subsystems to insure technical and schedule compatibility of the system as a whole.

(*b*) maintain surveillance over the detailed subsystems and overall weapon systems design to meet required Air Force objectives.

(*c*) establish and revise, if necessary, the program milestones and schedules; monitoring contractor progress in maintaining schedules consistent with sound judgment and rapid advancement of the state of the art.

(*d*) produces hardware only to the extent required in making analyses of participating prime contractors test data. In no case does STL (R–W) produce hardware in support of any portion of the airborne and/or ground support equipment on weapon systems of which they assist the Air Force in providing technical direction to the prime contractor.

All ground support equipment for missile weapon systems is procured under established provisioning procedures from the associate contractor who has developed and produced the basic component. This is an established Air Force procedure designed to assure continuity of engineering responsibility, compatibility of equipments, and to avoid burdensome administrative costs of separate contracts with numerous contractors for individual support items. The procedure being utilized in the Air Force ballistic missiles program is comparable to that which has been the policy in connection with other weapon systems.

You can be assured that small business will be given every possible consideration to participate in the ballistic missiles program and will be utilized to the greatest extent possible. However, the management concept and contracting structure previously defined dictates that we must continue to place the large prime contracts for the weapon systems with large industrial firms. This is to insure that sufficient scope and depth exists within the primes management structure to conduct a large program on a timely basis if we are to proceed from a research and development program to a position of delivering operational missiles to inventory at the earliest possible date.

The third point to be discussed relates to the present and potential opportunities for small business in missile subcontracting. Good opportunities do exist for small business to participate as a subcontractor, either directly to the participating primes and/or indirectly as a subcontractor to major subcontractors under the prime. In response to the emphasis being placed on small-business participation in the ballistic missiles program, Air Force Procurement Instruction No. 51–103 has been accepted and is being wholeheartedly pursued by our ballistic missile contractors. Under this instruction each ballistic missile contract contains a clause regarding the utilization of small business in which the contractor agrees to accomplish the maximum amount of subcontracting to small-business concerns. Subsequently, this places a responsibility on the Air Force office of administration for urging the prime contractor to take appropriate measures to assure that small-business concerns are afforded an equitable opportunity to compete for defense subcontracts within their capabilities.

As an example, the Douglas Co. is currently utilizing 8,473 small-business concerns as subcontractors in producing the Thor missile. Some of the items produced by these companies are temperature transducers, minature power resistors, lamp assemblies, trailer assemblies, and many other items of a similar nature. This example shows a definite contrast to the part small business plays as a subcontractor to our primes versus the limited opportunities small business has as a prime contractor under direct contract to the Government.

Air Materiel areas and Air Procurement districts in which our prime contractors reside are also actively engaged in apprising small business as to how they might fit into the overall ballistic missiles program through daily contacts and periodic meetings. For example, the Ogden AMA, in conjunction with Small Business Administration located in Denver, Colo., is currently planning a small business opportunity meeting to be held in Casper, Wyo., sometime during the latter part

of May 1958. Capable personnel from the BMD/BMO management complex will be represented at this meeting to present, discuss, and advise with small-business industries, as to how they might participate in the ballistic missiles program as related to that area of the country.

The fourth point to be covered deals with the activities of BMO in assisting small business toward realizing its fullest usefulness in the missile field. During the early stages of the research and development program, little interest was expressed by major subcontractors and small business directly to participate in the ballistic missiles program. There are three primary reasons which contributed to this situation. They are:

(1) The ballistic missiles program was highly classified; therefore, knowledge of the program could not be widely disseminated.

(2) Hardware was in the development stages; therefore, little or no effort was being expanded on production items.

(3) Major subcontractors and small-business concerns were being utilized by major primes in meeting our then current manned aircraft and missile programs.

As a result of the stretch-out and reduction in manned aircraft programs, prime, major subcontractors and small-business concerns across the board have been affected. Backlogs were canceled in some instances, and other orders were reduced and phased out over longer periods of time.

At this point in the defense effort, the ballistic missiles program began to gain emphasis and some publicity. Since that time, and with the advent of Sputnik I, II, et cetera, the ballistic missiles program has become the number one topic of discussion in the Nation.

In support of the Air Force policy and implementing procedures previously mentioned by the other witnesses, BMO developed certain internal procedures for stimulating small-business participation. In response to contractor interest generated by the widespread publicity of ballistic missiles, in May of 1957, BMD and BMO established offices of primary interest for receiving all inquiries, both written and oral, from contractors, large and small, desirous of participating in the program.

In this respect contractors have been encouraged to apply for assistance and guidance with regard to how they might participate in the ballistic missiles program. In this respect, the small-business office entertains daily visits from segments of small industry for the purpose of providing an opportunity for small business to present their capabilities to the key personnel of AFBMD and BMO. For example, during the month of March, 77 different firms contacted the Ballistic Missiles Office for guidance. Of this total number, 44 concerns were represented by small business.

As a part of BMO's briefing to such contractors, they are provided a list of prime contractors currently under contract in addition to a list of principal subcontractors currently participating in the program as major subcontractors to the prime contractors under contract. It is to be noted that this service is in addition to those services as are currently being provided by small-business specialists in each of the respective procurement districts of the participating prime contractors in our program.

For some time consideration had been given to the establishment of a small-business office within BMO; however, as explained earlier, offices of primary interest within BMO and BMD had been designated for all contractors seeking advice as to how they might participate. It was not until March of this year that I felt it necessary to establish a separate small-business office.

Further, I have personally sent a letter (Feb. 28, 1958) to all our prime contractors pointing out to them that as a result of the decreased manned aircraft production programs, increasing quantities of industrial capacities and skilled labors are becoming available and that due consideration must be given to these resources prior to considering additional requests for the expenditure of large sums of money for resources in support of current and/or accelerated missile requirements as may be dictated in the future. (A copy of this letter is attached.)

In addition to the responsibilities as outlined in the Air Force-wide regulations in the negotiation of a make and buy structure as part of the overall contract requirements, an internal regulation has been published, specifically outlining the responsibilities of various offices within the BMD/BMO complex. This internal regulation further emphasizes the effort being extended by the BMD/

BMO complex in motivating prime contractors in recognizing subcontracting and small-business participation in the ballistic-missiles program.

I have also personally advised the Air Procurement districts and Air Force plant representatives of the increasing emphasis being placed on small-business participation. Specifically, I have requested they closely monitor the policy and program being established by prime contractors under their jurisdiction to see that such policy is being implemented to the greatest degree possible consistent with economy and production control.

From time to time various speeches have been made to industries representing small business in various west coast areas. As recently as March 19, 1958, I personally spoke to the San Fernando Valley Chamber of Commerce, Northridge, Calif. This conference was attended by approximately 800 people representing approximately 250 small-business concerns. The theme of my speech was to acquaint small business with the overall procurement policy of the ballistic missiles program, the importance of logistics support of ballistic missiles, and an explanation of subcontracting and small-business structures. Also, an explanation of how small-business could aid us in reaching our goal at the earliest possible time.

Point 5 requested information as to present participation of small business in the missile program. Data that I have available with me today bears out the fact that we are currently enjoying a 21 percent participation by small business in the ballistic missiles program as a cumulative average since the inception of the program.

Total invoices as of December 31, 1957, by all prime contractors participating in the ballistic missiles program represent $1.3 billion. Of this amount, $269 million on first-tier subcontract basis went directly to small business as represented by the 21 percent previously mentioned in the foregoing statement. This percentage indicates that a very healthy condition exists, particularly since the prime emphasis in our program to date has been on research and development.

In addition to the 21 percent figure which goes directly from our prime contractors to small business, we are able to identify an additional 7 percent of the overall dollars which has been directed to small business as a second-tier subcontractor to major contractors of the primes. We know that additional amounts which we have not attempted to identify also go to small business throughout the many-tiered subcontract structure. Some examples of known participation by small business are as follows:

(*a*) Douglas Aircraft Co., Santa Monica, Calif., prime contractor for the Thor ICBM, reports that more than 23 percent, or $18 million, of their overall invoiced dollars as of December 31, 1957, went directly to small-business concerns.

(*b*) The Convair Astronautics Division of General Dynamics Corp., San Diego, Calif., prime contractor for Atlas ICBM, reports that more than 37 percent, or $105 million, of their overall dollars invoiced as of December 31, 1957, went directly to small-business concerns, representing some 2,875 companies.

(*c*) The Martin Co. located in Denver, Colo., and prime contractor on the Titan ICBM, reports that 27 percent, or $34.9 million, of total dollars invoiced as of December 31, 1957, also went directly to small-business concerns, representing 1,517 various companies.

(*d*) Our largest manufacturer of propulsion systems, Rocketdyne, a division of the North American Corp., located in Canoga Park, Calif., producers of the Atlas ICBM, Thor IRBM, and the Jupiter IRBM propulsion systems, reports that 20 percent, or $45 million, of total dollars invoiced as of December 31, 1957, went directly to small-business concerns, representing some 4,000 companies.

We appreciate the support we are now receiving from small-business firms throughout the country and we recognize that we must continue to have this support in the future if we are to produce and field the operational force of ballistic missiles at the earliest possible date.

EXHIBIT 6

HEADQUARTERS, AIR MATERIEL COMMAND

UNITED STATES AIR FORCE

Wright-Patterson Air Force Base, Ohio

FEBRUARY 28, 1958.

Subject: Contractor visitations to ballistic missile prime contractors' facilities.
Through: Air Force plant representative, Convair division, General Dynamics Corp., 3165 Pacific Highway, San Diego, Calif.
To: Convair division, General Dynamics Corp., 3165 Pacific Highway, San Diego, Calif.

1. As a result of recent news releases concerning the acceleration of ballistic missiles and outer space programs, wide interest is being generated within the aeronautical industry. Contractors, both large and small business not now participating in programs assigned the Ballistic Missile Division are visiting this complex daily seeking guidance as to how they might participate.

2. In response to these inquiries, provisions have been made within BMD and BMO to receive interested contractors in order that they may make their capabilities known. This includes formal and informal-type presentations by interested contractors to the extent that they present their technical know-how, past and present product lines, and resources capabilities. These presentations are attended by appropriate personnel from both BMD and BMO.

3. In those cases wherein it is determined that a contractor has an outstanding capability, either in technical know-how, production technique, and/or has available a product item applicable to our programs, further direction is provided.

4. In all cases, visiting contractors are advised and provided a list of all prime contractors currently participating in programs assigned this complex. As a result of this action your company, and all other participating primes, may be contacted by these same interested contractors.

5. This action has been taken in order that our prime contractors may also have the benefit of reviewing interested contractors' capabilities directly rather than indirectly from this office. In this respect, it is the desire of this office that contractors contacting your company be extended the privilege of discussing their capabilities to the fullest extent. This request is not to be construed to mean that this office endorses any company and/or product (all contractors so advised), however, as a result of interviews conducted by this complex it is quite possible that your company may receive guidance regarding specific contractors.

6. If your company determines that a specific contractor has a capability applicable to your program and you desire to enter into negotiations with said contractor, specific reference is made to the Industrial Security Manual for Safeguarding Classified Information (attachment to DD Form 441) in that (reference paragraph 28b) category 2 visit requests to not require the approval of AFBMD.

7. In providing this service a twofold mission will have been accomplished. One, we in the ballistic missiles business will be made aware of certain specialized capabilities which exist within industry. Secondly, it is the policy of the Air Force to conduct exhaustive search for open capacities for use in producing specialized items not normally manufactured by the prime in order to reduce facilities costs at the prime source prior to the placement of supplies and/or services contracts, including those for research and development. This is accomplished through the mediums of subcontracting in accordance with AFPI 53–101; therefore, every effort should be extended by the Government and industry to search and maintain in ready reference open capacities applicable to ballistic missiles production.

BEN I. FUNK,
Brigadier General, USAF, Deputy Director,
Ballistic Missiles Directorate, Procurement and Production,
(For the Commander).

The above letter was sent to the following addresses:
Convair, San Diego, Calif.
The Martin Co., Denver, Colo.
Douglas Aircraft Co., Santa Monica, Calif.
Lockheed Aircraft Corp., Sunnyvale, Calif.
A–C Spark Plug, Flint, Mich.
Arma, American Bosch division, Hempstead, Long Island, N. Y.
Burroughs Corp, Detroit, Mich.
Western Electric Co., New York, N. Y.
General Electric Co., Syracuse, N. Y.
Remington Rand Univac, St. Paul, Minn.
Avco Manufacturing Corp., Lawrence, Mass.
General Electric Co., Philadelphia, Pa.
North American Aviation, Inc., Conoga Park, Calif.
North American Aviation, Inc., Neosho, Mo.
Aerojet General Corp., Azusa, Calif.
Aerojet General Corp., Sacramento, Calif.
American Machine & Foundry Co., Pacoima, Calif.

The CHAIRMAN. Senator Thye, do you have any further questions?

Senator THYE. No questions.

The CHAIRMAN. Walter?

Mr. STULTS. General Senter gave one indication how they could standardize on Government-furnished equipment and said 70 percent of the missile system contractors are now using standard trailers. It is back on page 10 of your statement. How come it isn't 100 percent, General?

General SENTER. I think the answer to that, I will have to consult my staff, is that although it is a standard trailer some of the missiles won't fit on it, so that gives you 70 percent, but I can check it further.

Mr. STULTS. You found no one who had a missile which would fit on it who said, "look, we want to go into the making of trailers and you have given us the responsibility that if the missile blows up in the middle of the sky it is because you furnished us with the trailer."

General SENTER. Your assumption is correct. We have no contractors that have refused to use this trailer.

Mr. STULTS. Thank you.

Mr. WEADOCK. Mr. Sharp, we are always glad to see you. You are the only materiel secretary that we know of that was a small-business man. We feel that you are as sympathetic as you can be in your position with our problem. I would like to refer to page 2 of your statement where you say, "the procurement of missiles has not changed this picture, nor has it dictated the need for any sweeping changes in our program. Such changes as are needed will be made as the requirement becomes evident." Now, Mr. Barnes, the Administrator of the SBA believes that this is becoming an increasingly difficult problem. Secretary McGuire, you heard earlier, stated that he was acutely aware of it. The Under Secretary of the Air Force, Mr. MacIntyre, several weeks ago indicated that the trend was such that by 1962 missile procurement would outweigh manned aircraft 3 to 2. In your report last year your small-business participation, it was roughly somewhere around 8 percent, for, I presume, items, not only housekeeping items, but also some in relation to your manned aircraft procurement. We studied your claimant program report on guided missiles alone, and this constitutes some 0.8 percent. As we go further, so that by 1962 this is going to be a 3 to 2 ratio, your obligations; what more evidence could we perhaps bring to your attention that would indicate to you that some special programs or special

emphasis is required here? We feel, Mr. Secretary, that it is rather evident now and that perhaps this is the time to sort of gear up for that which is to come.

Mr. SHARP. I think that is a very fine observation and correct. We don't think that there is anything basically wrong with the system we are providing now. The only thing is that we would have to ride herd on it to the extent that, as was mentioned a little while ago, we should try to get more of this equipment into the Government furnished equipment category. We obviously can't give small business prime contracts, to any degree, for the great big missile systems. Our only hope is to break out parts of them as they become more standardized and have been proven and let contracts on these individual parts directly, in which case we can take in more small business. This situation has developed in the aircraft and aircraft support area over a period of years, but the missile system, as it is today, is largely in the research and development state. As I say, we won't have to change our small-business system, but we will have to see that we get back into our Government-furnished equipment category more and more items as fast as we can. This won't call for a change of what we do, it will call for a very careful surveillance of this area. I think that is the problem.

Mr. WEADOCK. What are the compelling reasons why you want to get back, insofar as you can, to Government furnished equipment purchasing?

Mr. SHARP. One very good reason which Senator Thye brought out a little while ago. Obviously, if we let somebody else manage the procurement of our equipment we must pay them something for doing it.

Mr. WEADOCK. It isn't the competitive aspect?

Mr. SHARP. We feel that among the subcontracting areas from the prime contractors we still have a higher percentage of competition involved. We have to see that the subcontracting procedures are correct and do bring in competition. I don't think we would be getting the items, as such, any cheaper than the subcontractor can buy them but it is true that we have to pay—I mean than the prime contractor can buy them—but it is true that we do have to pay the prime contractor something for supervising the purchase. If we can do it ourselves, we can save that amount of a fee.

Mr. WEADOCK. On the matter of security clearance that General Senter touched on, Mr. Secretary, would it be possible for the Air Force to present a statement to the effect of what a small contractor should do to obtain plant security clearance? We intend to ask this of all the military services.

Mr. SHARP. Yes; we can offer a statement now by Mr. Florence, who is here, or we can put a statement in the record.

Mr. WEADOCK. Well, sir, in the interest of time since we still have to hear from Convair, perhaps you can submit it later.

Mr. SHARP. Yes.

(The information subsequently supplied follows:)

EXHIBIT No. 7

STATEMENT ON INDUSTRIAL SECURITY FOR SENATE SMALL BUSINESS COMMITTEE

The following are the principal points about Air Force policy as it relates to disseminating classified defense information to private firms and the granting of facility security clearances:

(*a*) In accordance with section 7, Executive Order 10501, and Department of Defense Directive 5200.1 (tab A [1]), paragraph 109 of Air Force Regulation (AFR) 205–1 (tab B [1]) provides that classified information may be released only to private individuals, organizations, or firms who must have it to perform an official governmental function in the interest of promoting national defense. The performance of defense contracts constitutes an official governmental function within the meaning of Executive Order 10501. Also, a private firm may be requested to perform an official governmental function by supplying assistance or advice regarding an Air Force project even though the firm in question may not have a contract. The release of classified information, in other words, is not dependent upon the existence of a contract.

(*b*) The authority to release classified information to bidders and contractors is delegated according to paragraph 113, AFR 205–1, to commanders who have responsibility for the procurement of materiel, supplies, or services. Under paragraph 114, AFR 205–1, only the commander of a major air command or higher authority may release classified information to private firms.

(*c*) Responsibility for determining whether an element or item of classified information should be disclosed to a private firm, with or without a contract, rests with the official who has possession, knowledge, or control of the information involved and not upon the prospective recipient firm. (Pt. 4, par. III A 1, DOD Directive 5200.1; paragraph 8b, AFR 205–1.)

(*d*) Paragraph 113b, AFR 205–1, and paragraph 2–101 of the Armed Forces industrial security regulation (AFISR), tab C,[1] require that a facility security clearance be granted prospective bidders or contractors before giving them access to classified information. The facility security clearance procedure includes execution of a Department of Defense security agreement, investigating certain personnel of the private firm, and conducting a security survey of the firm's facility (par. 2–103, AFISR). Authority to grant a facility security clearance is delegated within the Air Force by paragraph 4 of AFR 205–9 (tab D [1]) to the commander having responsibility for security within the facility. Only the Office of the Secretary of Defense may deny a clearance (par. 2–111, AFISR).

(*e*) The Air Force or other contracting department generates a need for a private firm to be granted a facility security clearance. If the Air Force has a requirement from a procurement standpoint for inviting a private firm to submit a bid or quotation involving access to classified information, and the firm does not already have a facility security clearance, the Air Force will initiate action leading to the granting of a clearance. In this connection, the absence of security equipment such as safes, protective fencing, or other safeguards is not a factor for consideration and does not preclude the granting of a facility security clearance to contractors, prospective contractors, subcontractors, or prospective subcontractors. As specified in section VI of the security agreement form on page 95 of the AFISR, the terms of a contract may provide for costs chargeable to security requirements of the Government.

(*f*) As previously stated, classified information may be released to a private firm or individual even though the recipient is not a contractor. In such cases, a facility security clearance may or may not be required. Release of classified information to noncontractors can be made in areas in which the Air Force has an interest and in which specific firms or individuals are known to possess technical capabilities. For example, in an earlier statement made by Brigadier General Fulton, Air Research and Development Command, an explanation was given of the manner in which technical program planning documents are supplied to a great number of such firms or individuals. In such cases, Air Force policy, including paragraphs 109 and 114 of AFR 205–1, does not require that a facility security clearance be granted.

With regard to ASTIA, the following information is submitted:

(*a*) Department of Defense Directive 5160.4, dated February 21, 1955, tab E,[1] places responsibility on the Secretary of the Air Force to provide technical information and related services to activities of the Department of Defense and to

[1] Retained in committee files.

Department of Defense contractors. The purpose is to support the research and development program. ASTIA is the organization within the Air Force that receives, stores, and distributes technical and scientific documents pursuant to the Department of Defense directive and pertinent implementing Air Force regulations (par. 3, AFR 205–43, tab F [1]). The agency is assigned to the Air Research and Development Command and operates as an Air Force unit (AFR 20–19, tab G [1]).

(*b*) As provided in section II of the Department of Defense directive, the interchange of scientific and technical information must be consistent with effective security. Therefore, each military department retains control over the distribution of classified documents which it sends to ASTIA.

(*c*) ASTIA does not exist to assist in distributing classified or unclassified documents to private firms which are not Department of Defense contractors or subcontractors (pars. 5 and 6, AFR 205–43; sec. I, DOD Directive 5160.4). Private firms which have defense contracts receive classified documents from ASTIA after the release is approved by the commander concerned with the contract that is involved (pars. 5c (1) and (2), AFR 205–43). However, such approval is subject to established policy concerning release of classfiied information to contractors and the granting of facility security clearances (par. 1 above).

(*d*) An unclassified document may be released by ASTIA to contractors without prior approval of any other activity, unless the commander who sent the document to ASTIA imposed a restriction on such distribution. In support of functions of the Department of Commerce, unclassified technical and scientific documents are made available to that department for sale to the general public, including private firms which do not have defense contracts.

(*e*) Although the ASTIA system was not established to serve a requirement for the release of classified documents to a private firm which does not have a contract, it is possible for a military department to request ASTIA to transmit a copy of a classified document to such a firm when that department has approved the release in accordance with established security policy.

Mr. WEADOCK. Mr. Chairman, I have a couple of additional questions. General Senter, I want to agree with Senator Thye that yours was a fine statement. We seem to note in your statement the fine hand of your very capable Deputy, General Thurman, for whom this committee has a very high regard. Now, on page 2, General Senter, you state in your second paragraph:

> It is a program that has helped the Air Force place with small business direct, in prime contracts, an increasing amount of dollars each year since 1955. It is a program that has seen about 100 of our large prime contractors pay to small-business concerns, as first-tier subcontractors, $1,842,002,000 during 1957.

Now, I think it would be helpful, so the committee could properly evaluate that, to learn not only about almost 100 of your large prime contractors but what those who have contracts in excess of a million dollars have paid out totally. I mean, what is this $1 billion plus a percent of, you see? I don't think that it is too clearly defined at this point. You can do this later. Mr. Maurice Johnson, your executive for small business at Wright Field, could furnish this information to us.

General SENTER. I would be glad to give it to you later. I would like to be sure it is correct.

(The information subsequently supplied, follows:)

[1] Retained in committee files.

EXHIBIT 8

DEPARTMENT OF THE AIR FORCE,
OFFICE OF THE SECRETARY,
Washington, May 12, 1958.

Hon. GEORGE A. SMATHERS,
Chairman, Subcommittee on Government Procurement,
Select Committee on Small Business,
United States Senate.

DEAR MR. CHAIRMAN: The following information was requested by the subcommittee during the course of the recent small-business hearings. The request was made at the time General Senter was testifying.

"For calendar year 1957, 88 units of 70 large prime contractors reporting to the Air Force were paid $8,492,056,000 on defense contracts. These prime contractors in turn, during the same period, paid to small-business first-tier subcontractors $1,842,002,000, or 21.69 percent."

It is hoped that the above is the information that you desired.

Sincerely yours,

V. J. ADDUCI,
Colonel, United States Air Force
(For and in the absence of Joe W. Kelly,
Major General, USAF, Director, Legislative Liaison).

Mr. WEADOCK. Yes. On page 5 of your statement, General Senter, you state that—

while the basic responsibility rests with the prime contractors for decisions to make or buy, small-business participation is strongly urged by the Air Force when the decision is made to buy, rather than to make.

Now, what nature does this urging take? What do you do to accomplish this with the prime contractors? We think it is fine that you do it; but we wonder just how much emphasis you actually can place on that. We would perhaps like to see you have a mandatory weapon to utilize there; but that is somewhat of a controversial matter as you well understand.

General SENTER. Well, we do not have the power to force the contractor to make it mandatory that he carry out our desires; but I think we can put a great deal of pressure on our prime contractor, and I recently participated in keeping a contractor from bringing back into his plant a large subcontract. So we are looking at him very carefully. We do not have the power to force him to carry out our will, but I think we can do a great deal in persuading him to comply with our policies.

Mr. SHARP. After all, we are his best customer.

Mr. WEADOCK. He has to look to the future.

Mr. SHARP. He has to look to the future a litle bit. However, we are going to try to be more active in this area and one of the areas in which we feel that congressional and senatorial committees can be of great help to us, if cases can be called to our attention specifically where somebody has had work pulled back to the prime contractor or if he knows where there is work in the prime contractor's plant that they could do outside and claim they can do it cheaper; these are the areas we would like to know about. We can investigate them and frequently we find the allegations of the small business or even the larger business are correct. We appreciate very much knowing cases, and I think our best way of finding them out and policing these contractors and ourselves is to get information from the committees such as yours. It is very helpful to us.

Mr. WEADOCK. Well, sir, as Senator Smathers said in his opening statement, certainly we want to help the military services help small

business, and I am certain that Senator Sparkman, who is chairman of the full committee, will agree with that, too.

The CHAIRMAN. It is not only one of our purposes but it is one of the mandates under which the committee is set up.

Mr. SHARP. I can say we appreciate very much all the help you have given us, sir.

The CHAIRMAN. Thank you, Mr. Secretary, and all of those with you. You have given us a very fine presentation, and we are grateful to you.

Mr. SHARP. Thank you, Mr. Chairman.

The CHAIRMAN. Now, we have Mr. Howard Golem, director of procurement, Convair. Mr. Golem, will you come around please, sir? Mr. Golem, we are glad to have you and your associates with us.

Mr. GOLEM. Mr. Lamphier, our vice president, might have an opening remark.

STATEMENT OF THOMAS G. LANPHIER, VICE PRESIDENT, CONVAIR, A DIVISION OF GENERAL DYNAMICS CORP., SAN DIEGO, CALIF.

Mr. LANPHIER. My name is Tom Lanphier, I am here actually in substitution for Mr. Biron, who is our vice president in Convair for this area of our enterprise. He is at the moment unavoidably detained on the coast in some debates we are having with people in the units who work with us. We explained this to counsel, and I think he understands it.

I am here to answer any policy questions that might arise. Mr. Golem, who is our director in charge of procurement, will offer the statement and Mr. Carl F. Uhden, on his left, who is the manager of material for the astronautics material office, will supplement any questions about the ballistics program which is involved.

The CHAIRMAN. Thank you, very much, Mr. Lanphier.

STATEMENT OF HOWARD G. GOLEM, DIRECTOR OF PROCUREMENT, CONVAIR, SAN DIEGO, CALIF.

Mr. GOLEM. I would like to enter this letter into the record which I think substantially answer all the questions, dated April 25.[4]

Reference is made to your letter of April 11, 1958, requesting certain data concerning policy, procedures, and specific questions with respect to procurement with small-business companies.

We do recognize and comply with the intent of the Armed Services Procurement Regulation 1–707 insofar as it pertains to the prime contractor. Convair's policy to utilize small-business vendors was defined to the procurement personnel and issued as a company policy instruction in Convair standard practice 6–7 dated October 10, 1955, after receipt of Department of Defense Directive 4100.20. This instruction has been implemented by purchasing department instructions, procurement manuals, and bulletins. These procedures define "small business" and require that the buyer solicit quotations from small business. Procedures have been provided for reporting data necessary for preparation of form DD–1140.

Howard G. Golem, Director of Procurement, is the appointed small-business liaison officer for Convair. He has appointed the

[4] Letter dated April 25, 1958, addressed to Senator Smathers, chairman, Subcommittee on Government Procurement by Mr. R. H. Biron, vice president, Convair.

material managers as small-business liaison officers for the separate divisions of the company.

Convair has actively participated in small-business opportunity exhibits and committees. Display articles are provided and personnel are at the exhibits to discuss with small business the products which we purchase. Mr. Golem is a member of the National Board of Field Advisers for the Small Business Administrator and has just attended the regional directors meeting concerning the Pacific Missile Range potential procurement. Convair has received an unsolicited small-business letter (from Pacific Automation Products) which expresses the appreciation of that small company for Convair's assistance in placing it in a successful position as a defense producer. This small concern is now rapidly approaching the scope of large-business activity.

Certain Convair divisions (San Diego and Fort Worth) are devoted substantially toward aircraft production, however, it is understood that this hearing is directed specifically toward the field of missiles, rockets, and out-space exploration. The data submitted, therefore, concerns the astronautics division, whose major project is the Atlas and the Pomona division, whose major projects are the Terrier and the Tartar. The following comments are in reply to the specific questions in the April 11 letter and are identified in the same sequence, viz, (*a*) through (*j*).

(*a*) The total dollar value of prime contracts and first-tier subcontracts for missiles and related items, research and development and production contracts are:

EXHIBIT 9 (a)

Calendar year 1956	$68, 927, 954
Calendar year 1957	291, 857, 162
Calendar year 1958 through Mar. 31	198, 734, 947

The CHAIRMAN. Does that mean you have used that much through March 31, or is that projected for the year?

Mr. GOLEM. This is the amount of prime contracts and first subcontract that we have received awards for.

(*b*) During calendar year 1957, payments totaling $126,715,000 were made to subcontractors by the Astronautics and Pomona divisions. Of the 3,952 suppliers, 3,169 or 80 percent were small-business concerns. These concerns received 58.1 percent or $73,633,000. None of these vendors were affiliated with Convair division of General Dynamics. A substantial number have previously been suppliers of our requirements. Submitted herewith as exhibit A is a list of over 3,346 vendors supplying materials, parts, and services to the Astronautics division. We can enter exhibit A which is this.

The CHAIRMAN. Fine. We are very glad to have this material which will be retained in our committee files.

Mr. GOLEM. Also shown is the dollar amount of commitments during 1957 and to date in 1958. Also shown is the dollar amount committed to each congressional district and the designation of the company named as large or small business. The aggregate commitment is $77,344,633 of which $56,118,000, 72.6 percent, is made to small-business concerns and $21,226,632 to large concerns. Also attached is exhibit B, an approved list of vendors, most of whom are actively supplying the Pomona division.

I do not wish to have this a matter of public record because it does contain some financial data with respect to those vendors.

The CHAIRMAN. I will say this will be kept in the committee files and will not be published.

Mr. GOLEM. With respect to the Pomona division, we also have a list, exhibit C, of companies identified as "large" and "small" to whom payments in excess of $50,000 were made during 1957. With respect to Pomona division, we also have a list which is exhibit C which is here.[5]

(*c*) All matters concerning contract terminology, specifications, and delivery schedules are negotiated by the buyer, and where these cannot be resolved they are referred to the department head. This results in settlement or recommendations to the director of procurement, who reviews the facts with the benefit of such other general-office assistance as may be required for appropriate action. The purchasing manual and department instructions include procedures for vendor information request (VIR) and vendor approval form (VAF). On numerous occasions, the vendor has suggestions for improvement in the product or more economical manufacture. The VIR or the VAF is processed by the purchasing department to the engineering or appropriate department where approvals, compromises, or rejections are determined. Each purchasing department has assigned to it a contract analyst, who has legal training and is able to resolve contractual terminology difficulties or properly submit the controversy to the general-office legal department through the director of procurement. Convair enjoys a good relationship with its vendors and has very few controversial issues involving a contractual breach.

(*d*) The extent of subcontracting is one of the factors taken into account in determining the amount of profit Convair seeks under its prime contracts with the armed services; however, no specific rate of profit on the subcontract portion of the work is established in negotiation. The functions performed by Convair on subcontracted items are generally the same as those performed in connection with parts produced in its plants with the exception of the actual manufacturing operations. For example, Convair normally supplies the original design information and must receive, inspect, stock, install, and assume responsibility for such subcontract parts. In addition, Convair must perform the necessary purchasing functions and often supplies engineering and manufacturing liaison and "know how" to the subcontractor during manufacture.

EXHIBIT D [5a]

Astronautics and Pomona employment

	Jan. 1, 1956			Jan. 1, 1957			Jan. 1, 1958		
	Astronautics	Pomona	Total	Astronautics	Pomona	Total	Astronautics	Pomona	Total
1. Administrative and managerial	214	630	844	980	580	1,560	1,570	570	2,140
2. Engineering	1,227	1,220	2,447	2,087	1,766	3,853	2,502	1,665	4,167
3. Clerical and Sales	400	700	1,100	1,500	1,000	2,550	1,900	700	2,600
4. Service and maintenance	20	189	209	60	196	256	120	187	307
5. Skilled and semiskilled	530	1,000	1,530	1,350	1,160	2,510	2,200	900	3,100
6. Unskilled	390	464	854	590	608	1,198	536	394	930

[5] Retained in committee files.
[5a] This exhibit listed in table of contents as exhibit 9 (b)

(*e*) Exhibits (a), (b), and (c) supporting question (b) identify subcontractors as to large or small.

(*f*) Security procedures are established to protect classified matter. Vendors are assisted in obtaining Government security clearance by providing information as to parties to contact and general information as to the procedure required to obtain security clearance. All security information is coordinated through Convair security office to the Government security officer on each contract or purchase order (of a security nature) placed. Convair security officer does not personally review the vendor's plant for compliance, but coordinates with the Government security officer in requesting that the subcontractor be checked for clearance. Inability by a vendor to get such clearance definitely precludes him from working on security orders. Many times small business concerns cannot afford the security fencing, guards, and other measures necessary, but if they are otherwise a good qualified producer, they are given work which is not restricted by security. When a company is not properly cleared, but the officer or individual contacting us does have a clearance, he is permitted to review the data which we desire to place outside so that he can properly assess and determine whether security measures and the cost thereof are warranted under the circumstances.

(*g*) No work has been withdrawn from a subcontractor for the purpose of self-producing in our own shops, except where the prime contract was reduced in quantity and the subcontractor was a second source to our factory.

Mr. STULTS. On (*g*), has that happened to you under the missile program?

Mr. GOLEM. In the Pomona division on material?

Mr. STULTS. On material.

Mr. GOLEM. In 1956 in December, dual sources had been established with permission of the Government to have Motorola as one subcontractor and Bendix as another, be a second source to us in our Pomona division. When the cutback in the program was reduced about 50 percent in quantity and the result was that by agreement we would buy only certain parts from Bendix and Motorola and then carry on, incorporating with these details into assemblies and the other major portions which we built in our plant.

Mr. STULTS. Did that require any additional facility for you?

Mr. GOLEM. No, sir.

Mr. STULTS. So you could operate with what you did have at hand?

Mr. GOLEM. That is right. In effect, I think, what we probably did also minimized some of the profit which was mentioned earlier. It was by agreement with Motorola and Bendix that we worked this out.

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(*h*) Following is a recap of increased plant facilities at the Pomona and Astronautics plants during calendar 1956 and 1957 and to date:

EXHIBIT 9 (c)

	Jan. 1, 1956, square feet	Increased square feet	Total square feet	Increase	
				Total	Percent
Pomona: Terrier-Tartar (Navy)	1,415,000	22,000	1,437,000		1.5
Astronautics:					
Atlas-Azura (Air Force) in San Diego division		263,000	164,000	427,000	
Leased off-site warehouse			291,000	291,000	
New facility [1]			316,000	316,000	
Total		263,000	771,000	1,034,000	75.0
Grand total		1,678,000	793,000	2,471,000	32.0

[1] Balance of 784,000 square feet under construction not yet completed.

(*i*) During calendar 1956, 1957, and up to date, the following additional government facilities and financing have been made available to Convair for the production of missiles.

The Navy made $2,700,688 of additional facilities available to the Government-owned plant occupied by the Pomona division which was engaged in the development of the Tartar missile and production of Terrier missiles for the Navy. This provided 22,000 square feet of additional engineering space and equipment for systems testing and electronic laboratories, quality control and inspection, replacement of machine tools and some dip soldering equipment.

The Air Force made available Government facilities in the amount of $12,120,877 for development and production operations in connection with the Atlas missile and the Azusa missile tracking system. This facilitization consisted primarily of engineering laboratory and development type equipment, such as large analog computers, specialized vibration testing equipment, environmental test chambers, and laboratory items of all types. Also provided were automatic welding and other associated production equipment including heavy machine tools.

In addition to Government-owned facilities and equipment made available to the San Diego plant, the Air Force made available to Astronautics, test facilities at a number of Government-owned test sites around the country. These included 2 missile-system developmental test stands at Sycamore, near San Diego, and 3 similar test stands at Edwards Rocket Base. Convair constructed the 2 stands at Sycamore and 1 stand at ERB with a no-profit Government facilities contract. The other stands were built by the Army Engineering Corps for the Air Force and were later made available to Convair for use in its testing program.

At Patrick Air Force Base, the Government also provided four launching complexes, including flight test stands, blockhouses and other supporting facilities. Two of these were constructed by Convair under a no-profit facilities contract to speed completion as fast as possible, and the other two were built concurrently by the Army Engineering Corps for the Air Force and completed at a later date. With respect to construction under contract to Convair, all work was subcontracted and largely accomplished by labor in the area involved.

Convair was not granted any special financing considerations; it did receive the usual progress payments under certain fixed price contracts for supplies and services and certificates of necessity were received for portions of certain of its facilities.

(*j*) The number of employees in the classifications for the periods requested are shown on exhibit D.[6]

Convair will continue to use small business to the maximum extent possible and recognizes small company advantages, such as flexibility, expediency and economy. However, the state of the art, technology, and complexity of many electronic, hydraulic and pneumatic parts require extensive engineering ability and environmental testing equipment. Factors such as these preclude small business without these capabilities from participating in our procurement.

Mr. WEADOCK. Referring to the "new facility" in the table on page 4, are you building this new facility? Is Convair building it?

Mr. GOLEM. Convair is putting up its capital to build a $20 million plant in San Diego.

Mr. WEADOCK. There is no financial provision by the Government?

Mr. GOLEM. Not for the building of the brick and mortar.

Mr. WEADOCK. Machine tools perhaps?

Mr. GOLEM. Specialized machine tools such as centrifuge machines and special equipment we could no longer use if we didn't have this project. Without the project, it wouldn't be used.

Mr. WEADOCK. What would you do? Upon completion of the project, would you return these to the Government?

Mr. GOLEM. They are owned by the Government as a Government facility and tagged on the books of the Government.

Mr. WEADOCK. Could you tell us what rental you are paying on these machine tools?

Mr. GOLEM. Tools. The rental rate. I don't happen to know that.

Mr. WEADOCK. Could you furnish that to us subsequently?

Mr. GOLEM. Yes.

(See Mr. Lanphier's statement which follows:)

Mr. WEADOCK. Thank you, very much.

The CHAIRMAN. Thank you, Mr. Golem.

Mr. LANPHIER. Mr. Weadock, may I clarify something here? What was your question to Mr. Golem about the astronautical facilities there?

Mr. WEADOCK. Didn't Mr. Golem refer to some new machine tools that were going to be put into this new plant of the Astronautics division? I don't suppose you are putting anything in your new warehouse but your materials.

Mr. LANPHIER. The answer is that we don't pay rental on that. At the moment we have no forseeable commercial use for it so all the use we are making of it at the moment, or will in the future, will be in behalf of the Air Force and therefore we pay them no rental. It is Government-owned.

Mr. WEADOCK. Do you have any machine tools, Mr. Lanphier, that you are utilizing in commercial enterprise that you are paying rental on at this time?

Mr. LANPHIER. I don't know. Howard, do we?

Mr. GOLEM. I don't know of any.

[6] See p. 102.

Mr. LANPHIER. Not in the missile program, no. We may have in our San Diego division where we make our commercial jet, where we make fighters for the Air Force.

Mr. GOLEM. It is more than likely the other way that a lot of astronautics parts are made with machine tools that are owned by us, company-owned tools.

Mr. WEADOCK. You don't reimburse the Air Force or whoever owns the tools for a depreciation?

Mr. LANPHIER. I don't know the answer to that.

Mr. GOLEM. I think we are trying to get at a subject that comes up every once in a while in connection with subcontracting to a subcontractor who has some Government-owned facility tools and some of his own tools and this matter of rent and payment comes up. Also, we consider it in the quotation from the subcontractor as to whether he is using his own tools or whether he is using Government-owned equipment. This substantially works this way, that a subcontractor, if he uses Government facilities, machinery, and equipment to do a job, he, under his facilities contract, has an arrangement with the Government to pay something like 1 percent per month and there was some talk recently about increasing it to 2 percent per month. I think this actually will apply because the machine-tool industry took quite an interest in that area. In that case they would incorporate the rent they pay the Government for the machine tools based on the number of hours they actually apply to making those parts. If a part of them was done on their own company-owned tools, this would not be charged. It didn't particularly apply, I think, to a prime such as Mr. Lanphier is mentioning where the Government is putting a special computer and analog item for testing equipment where it isn't used by anybody else.

The CHAIRMAN. Mr. Uhden, do you plan to make a statement?

Mr. UHDEN. No, sir.

The CHAIRMAN. Do you have any questions?

(No response.)

The CHAIRMAN. Thank you, very much, gentlemen. We certainly appreciate all this trouble you have gone to to come this great distance, and also the very fine manner in which you have prepared the information for us.

Mr. GOLEM. We are glad to have helped.

(The full text of Mr. Golem's statement follows, consisting of a letter dated April 25, 1958, addressed to Senator Smathers and signed by R. H. Biron, vice president of Convair.)

CONVAIR,
San Diego, Calif., April 25, 1958.

Hon. GEORGE A. SMATHERS,
Chairman, Subcommittee on Government Procurement,
United States Senate, Washington, D. C.

DEAR SIR: Reference is made to your letter of April 11, 1958, requesting certain data concerning policy, procedures and specific questions with respect to procurement with small business companies.

We do recognize and comply with the intent of the armed services procurement regulation 1–707 insofar as it pertains to the prime contractor. Convair's policy to utilize small business vendors was defined to the procurement personnel and issued as a company policy instruction in Convair standard practice 6–7 dated October 10, 1955, after receipt of Department of Defense Directive 4100.20. This instruction has been implemented by Purchasing Department Instructions, Procurement Manuals and Bulletins. These procedures define small business and require that the Buyer solicit quotations from small business. Procedures

have been provided for reporting data necessary for preparation of form DD–1140.

Howard G. Golem, director of procurement, is the appointed small business liaison officer for Convair. He has appointed the material managers as small business liaison officers for the separate divisions of the company.

Convair has actively participated in small business opportunity exhibits and committees. Display articles are provided and personnel are at the exhibits to discuss with small business the products which we purchase. Mr. Golem is a member of the National Board of Field Advisors for the Small Business Administrator and has just attended the regional directors meeting concerning the Pacific missile range potential procurement. Convair has received an unsolicited small business letter (from Pacific Automation Products) which expresses the appreciation of that small company for Convair's assistance in placing it in a successful position as a defense producer. This small concern is now rapidly approaching the scope of large business activity.

Certain Convair divisions (San Diego and Fort Worth) are devoted substantially toward aircraft production, however, it is understood that this hearing is directed specifically toward the field of missiles, rockets, and outer space exploration. The data submitted, therefore, concerns the astronautics division, whose major project is the Atlas and the Pomona division, whose major projects are the Terrier and the Tartar. The following comments are in reply to the specific questions in the April 11 letter and are identified in the same sequence, viz, (*a*) through (*j*).

(*a*) The total dollar value of prime contracts and first tier subcontracts for missiles and related items, research and development and production contracts are:

Calendar year 1956	$68, 927, 954
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(*b*) During calendar year 1957, payments totaling $126,715,000 were made to subcontractors by the Astronautics and Pomona divisions. Of the 3,952 suppliers, 3,169 or 80 percent were small business concerns. These concerns received 58.1 percent or $73,633,000. None of these vendors were affiliated with Convair division of general dynamics. A substantial number have previously been suppliers of our requirements. Submitted herewith as exhibit A[1] is a list of over 3,346 vendors supplying materials, parts, and services to the Astronautics division. Also shown is the dollar amount of commitments during 1957 and to date in 1958. Also shown is the dollar amount committed to each congressional district and the designation of the company named as large or small business. The aggregate commitment is $77,344,633 of which $56,118,000 (72.6 percent) is made to small business concerns and $21,226,632 to large concerns. Also attached is exhibit B,[1] an approved list of vendors, most of whom are actively supplying the Pomona division. With respect to the Pomona division, we also have a list, exhibit C,[1] of companies identified as large and small to whom payments in excess of $50,000 were made during 1957.[1]

(*c*) All matters concerning contract terminology, specifications and delivery schedules are negotiated by the buyer and where these cannot be resolved, they are referred to the department head. This results in settlement or recommendations to the director of procurement, who reviews the facts with the benefit of such other general office assistance as may be required for appropriate action. The purchasing manual and department instructions include procedures for vendor information request (VIR) and vendor approval form (VAF). On numerous occasions, the vendor has suggestions for improvement in the product or more economical manufacture. The VIR or the VAF is processed by the purchasing department to the engineering or appropriate department where approvals, compromises or rejections are determined. Each purchasing department has assigned to it a contract analyst, who has legal training and are able to resolve contractual terminology difficulties or properly submit the controversy to the general office legal department through the director of procurement. Convair enjoys a good relationship with its vendors and has very few controversial issues involving a contractual breach.

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[1] Retained in committee files.

with parts produced in its plants with the exception of the actual manufacturing operations. For example, Convair normally supplies the original design information and must receive, inspect, stock, install, and assume responsibility for such subcontract parts. In addition, Convair must perform the necessary purchasing functions and often supplies engineering and manufacturing liaison and know-how to the subcontractor during manufacture.

(*e*) Exhibits A, B, and C supporting question (*b*) identify subcontractors as to large or small. (Retained in committee files).

(*f*) Security procedures are established to protect classified matter. Vendors are assisted in obtaining Government security clearance by providing information as to parties to contact and general information as to the procedure required to obtain security clearance. All security information is coordinated through Convair security office to the Government security officer on each contract or purchase order (of a security nature) placed. Convair security officer does not personally review the vendor's plant for compliance, but coordinates with the Government security officer in requesting that the subcontractor be checked for clearance. Inability by a vendor to get such clearance definitely precludes him from working on security orders. Many times small-business concerns cannot afford the security fencing, guards, and other measures necessary, but if they are otherwise a good qualified producer, they are given work which is not restricted by security. When a company is not properly cleared, but the officer or individual contacting us does have a clearance, he is permitted to review the data which we desire to place outside so that he can properly assess and determine whether security measures and the cost thereof are warranted under the circumstances.

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Convair was not granted any special financing considerations; it did receive the usual progress payments under certain fixed price contracts for supplies and services and certificates of necessity were received for portions of certain of its facilities.

(*j*) The number of employees in the classifications for the periods requested are shown on exhibit D. (See p. 102.)

Convair will continue to use small business to the maximum extent possible and recognizes small company advantages, such as flexibility, expediency, and economy. However, the state of the art, technology, and complexity of many electronic, hydraulic, and pneumatic parts require extensive engineering ability and environmental testing equipment. Factors such as these preclude small business without these capabilities from participating in our procurement.

Very truly yours,

R. H. BIRON,
Vice President, Administration.

The CHAIRMAN. Thank you very much. Mr. Weadock, did you wish to be recognized?

Mr. WEADOCK. Yes, Mr. Chairman. I have here several letters or briefs that various companies and associations have submitted to the committee in connection with these hearings. I would like to recommend that they be accepted for inclusion in the appendix of the printed record. (See appendix pp. 212–226.)

Mr. CHAIRMAN. Without objection it is so ordered.

The committee will stand in recess until 10 o'clock tomorrow morning.

(Whereupon, at 1:15 p. m., the subcommittee recessed, to reconvene at 10 a. m., Thursday, May 1, 1958.)

THE ROLE OF SMALL BUSINESS IN DEFENSE MISSILE PROCUREMENT—1958

THURSDAY, MAY 1, 1958

UNITED STATES SENATE,
SELECT COMMITTEE ON SMALL BUSINESS,
SUBCOMMITTEE ON GOVERNMENT PROCUREMENT,
Washington. D. C.

The subcommittee met, pursuant to recess, at 10 a. m., in room P–63, United States Capitol Building, Washington, D. C., Senator Alan Bible presiding.[1]

Present: Senators Bible, Smathers, Sparkman, and Thye.

Also present: Walter B. Stults, staff director; Robert L. Weadock, professional staff member; and William D. Amis, professional staff member.

Senator BIBLE. The meeting will please come to order.

Gentlemen, this is the concluding day of the hearings being conducted by the Subcommittee on Government Procurement of the Senate Small Business Committee with regard to the participation of small business in our military missile, rocket, and outer space exploration programs.

Today we will hear spokesmen for both the Navy and the Army. The subcommittee is extremely pleased to have as its first witness today Hon. Fred A. Bantz, Assistant Secretary of the Navy (Material). Mr. Secretary.

Mr. BANTZ. I have a statement here that will take about 12 or 14 minutes to read; I can read it if you prefer or put it in the record.

Senator BIBLE. You may proceed in whatever manner you choose.

STATEMENT OF HON. FRED A. BANTZ, ASSISTANT SECRETARY OF THE NAVY FOR MATERIAL, ACCOMPANIED BY VICE ADM. E. W. CLEXTON, CHIEF OF NAVAL MATERIAL; REAR ADM. R. E. DIXON, CHIEF OF THE BUREAU OF AERONAUTICS; REAR ADM. PAUL D. STROOP, CHIEF OF THE BUREAU OF ORDNANCE; AND REAR ADM. W. F. RABORN, CHIEF OF THE SPECIAL PROJECTS DIVISION, BUREAU OF ORDNANCE

Mr. BANTZ. Mr. Chairman and members of this committee, I am pleased to have this opportunity to appear again before you to discuss the small-business program of the Navy. At the time of my first appearance before you last July, I was being introduced to the Navy's small-business program. During the past 9 months I have kept in close touch with it, and I can now talk to you with considerable personal knowledge of the subject.

[1] Subsequently Senators Smathers and Sparkman took the chair.

First I would like to report briefly on certain commitments which were made to you last July.

At that time we said that the Navy would pay particular attention to availability of specifications and drawings when making procurements of items within the small-business potential. Soon after that hearing all small-business specialists of the Navy were instructed that in the course of their review of each procurement they were to pay close attention to the availability of specifications and drawings and, where such availability was not adequate, to hold up the procurement and arrange to obtain the necessary information. If holding up procurement was not practicable because of pressure of time, they were instructed to see that, where feasible, steps were initiated at once to make sure that required data would be available the next time the particular item involved was to be procured. These instructions were followed up by a change in Navy procurement directives incorporating these provisions. A copy of this change has been provided to your staff. (Retained in committee files.)

Also last July the Chief of Naval Material, Vice Adm. E. W. Clexton, said he would endeavor to increase the set-asides of jet fuel. This has been done. In fiscal year 1957 we set aside for small business 8 million barrels of jet fuel. For the first 9 months of fiscal year 1958 we have set aside 10,700,000 barrels. Total awards to small business of all petroleum products amounted to $216 million in fiscal year 1957 or 23 percent of all domestic awards. For the first 9 months of fiscal year 1958 awards to small business have amounted to $237 million or 31 percent.

You asked that we make five specific reports to you following the hearings; these have been made.

In particular, when talking about subcontracting by large firms with small business and about research and development contracting with smaller firms, you were told that we would undertake a more vigorous approach to the whole problem. This has not been easy since the small-business program was already well developed, but two measures which we are working on I think you will find constructive.

In connection with subcontracting, we took the special step last October of impressing on each of our major prime contractors the necessity of subcontracting as large an amount as possible to small business consistent with sound procurement. This was done at a time when decreasing Government purchases in some areas might have influenced prime contractors to pull into their own plants work for which formerly they subcontracted. Submitted with this statement is a copy of the type of letter sent to the prime contractors and a copy of the letter to the chiefs of the bureaus concerned in which they were directed to take this action. (See exhibits 10(b) and 10(c), p. 118.)

In addition to this step in October, we have recently addressed a special inquiry to selected primes by which we seek to evaluate the effectiveness of our subcontracting program and to gain more information on the problems involved. We will use the information to sharpen our procedures where necessary and bring about more subcontracting to small business if we can. Submitted herewith is Office of Naval Material notice 4285 of March 25 requiring that this be done and indicating the specific type of questions to be asked.

These special measures in the subcontracting area have strengthened the screening of primes' subcontracting by the bureaus and field offices

of the Navy. Reports to us from the prime contractors, whose participation in the defense small-business subcontracting program is administered by the Navy, indicate that for the 6 months ending December 1957 first-tier subcontracting to small business amounted to about 20 percent which is the same percentage reported for the same period the previous year. This does not indicate the severe drop that we feared.

Our second basically new step will be to hold briefings at regular intervals for qualified small businesses on the general direction of our research and development plans and on particular research and development problems. An accompanying feature of this procedure is that all our offices in the field are prepared to instruct small business on how they may make their capabilities known to our bureaus. The particular significance to small business of these briefings is not only that they aid in competing for current research and development procurements, but, perhaps more importantly, that the briefings will provide guidance as to future procurements and hence may help in planning plant development and personnel training. A copy of our implementing directive in this matter is provided with this statement. (See exhibit 10(d) p. 119, and 10(e) p. 120.)

In addition to these steps we have endeavored to develop the small-business program wherever possible. Our overall percentage of prime awards to small business for the first 9 months of this fiscal year is 16.8 as compared to 15.8 at this point last year.

Coming now to the chief subject of this hearing, you have already received considerable detailed data about the procurement of individual missiles by the Navy and the small-business participation therein. These data include both our direct purchases for our missile programs and, insofar as we can determine, the purchases by our prime contractors of components supporting our direct purchases.

I assure you that my office and the interested bureau chiefs have watched the developing pattern of missile procurement in the Navy with a growing concern for the share of small business. In general, I concur with the testimony as to the magnitude and complexity of modern missiles and the limitations these characteristics place on the participation of small business at the prime contracting level. Despite this complicating factor we examine each missile procurement when it is in the planning stage to make sure that we utilize small business wherever possible consistent with sound procurement. In numbers of separate actions our direct awards to small business during the first 8 months of this fiscal year have amounted to nearly one-quarter of the total procurement actions taken under our missile program. In certain direct purchases under our missile program we have been able to make 100 percent set-asides for small business. Nevertheless, dollarwise the results have not been in keeping with the efforts devoted to the program. Awards to small business have amounted dollarwise only to about 3 percent.

At the subcontracting levels the situation is better, of course. We have consistently kept our prime contractors alert to their responsibility to do as much of their subcontracting with small business as possible. Our semiannual reports from prime contractors do not show missile work separately; hence I cannot give you exact figures on subcontracting in this particular area. However, recently we have asked prime missile contractors for specific information. Judging

from their replies we estimate that at least 20 percent of our dollars awarded to large prime contractors for missile work is subcontracted by them to small business. Further subcontracting by large missile subcontractors also occurs with small business to an unknown extent.

Thus you can see that about 23 percent of our missile money is believed to have gone to small business—3 percent in prime contracts and 20 percent in subcontracts. This compares with about 40 percent to small business for all Navy procurement. Not a satisfactory situation. However, during this period of rapid technological change many of our missile projects have tended to linger in the research and development stage with production being limited to improving prototypes. Many complex considerations, among them cost, use of available industrial capacity, and operational risk, enter into a decision finally to go into full production. If quantity production increases in the future with attendant clarification of design and assembly problems, it can be expected that greater opportunities for small-business competition will occur.

With me here today are Vice Adm. E. W. Clexton, Chief of Naval Material; Rear Adm. R. E. Dixon, Chief of the Bureau of Aeronautics; Rear Adm. Paul D. Stroop, Chief of the Bureau of Ordnance; Rear Adm. W. F. Raborn, Chief of the Special Projects, Division of the Bureau of Ordnance. These four officers are responsible for the missile programs of the Navy and for insuring that these missiles possess the necessary technical characteristics and are obtained at the time and in the quantity required to meet the defense needs of our country. This is their principal job and they have devoted themselves unsparingly to it. At the same time they have always kept in mind the small business objectives of the Navy and have cooperated closely with me in doing all possible to insure that small business is given as much as it can capably handle.

These gentlemen will provide you with further details as to our missile procurement.

Mr. Chairman, after the questions are put to me, I would like to have Admiral Raborn be the next man because he is leaving town and I would appreciate it if he could speak next.

Senator BIBLE. It is quite acceptable to have Admiral Raborn testify next.

First, I want to compliment you on what appears to me to be a very responsive statement considering the purpose and the field of inquiry which the Small Business Committee is concerning itself in this missile procurement. I think it does reflect an awareness on the part of yourself and those around you of the problem in which we are interested. I certainly hope that you will personally follow through to see that small business receives an increasing share of these prime contracts. Now, I don't know, I imagine that this is an area of speculation and the question is probably quite hard to answer. As I understand it, you say this fiscal year the Navy has placed something in the neighborhood of 3 percent of prime contracts for missiles with small business. Would you have any forecast as to what that percentage might be in fiscal year 1959, for example?

Mr. BANTZ. Well, that 3 percent, sir, is over a period of years but I think as we get into production and out of the research and development stage we have a right to expect that percentage to go up.

Senator BIBLE. It would show some upward trend as the development and research is further along and more mature, is that a correct statement?

Mr. BANTZ. That is right.

Senator BIBLE. Of course, the percentage that you place with the prime contractors and that is subsequently placed with subcontractors holds very steadily at about 20 percent, is that a correct statement?

Mr. BANTZ. I think as our efforts increase on it, sir, it should go up. We are making a great many strides that way through Admiral Clexton's office and through the Bureau offices we are doing a lot of things to not only acquaint prime contracts but to insist and we are reporting a system as of now, I think, which indicates that we have a right to expect more than 20 percent.

Senator BIBLE. I want to compliment you again for your awareness of the problem and urge you to continue to be alert in securing not only the prime contracts but the subcontracts in this particular field.

Mr. Stults?

Mr. STULTS. I have no questions at this point.

Senator BIBLE. Mr. Weadock.

Mr. WEADOCK. Mr. Chairman. I think that although we have had the pleasure of hearing from Mr. Secretary Bantz, the committee is also very pleased to have Admiral Clexton with us today. We have certainly found him to be a helpful and true friend toward the work this committee is trying to accomplish.

Mr. Secretary, last year in 1 of our 2 committee reports a recommendation was made suggesting the individual services address themselves to the problem of the larger prime contractors annexing additional Government facilities for the purpose of increasing their self-production of work called for under the prime contracts. The committee recommended that the services make a check to insure that there were not small-business facilities in the immediate neighborhood that could perform this work on a subcontracting basis. I wonder if you could tell us what the Navy might have done in that connection?

Mr. BANTZ. Could I have Admiral Clexton answer that?

Mr. WEADOCK. All right, sir, fine.

Admiral CLEXTON. I believe the facilities that have been given to accomplish our missile program have been given both to the prime contractors and to the small business and subcontractors. The type of facilities that we give must be given to both of them. They are so closely related to the item they are making that they are almost unavailable in general business areas.

Mr. WEADOCK. Admiral, are you talking about testing facilities or launching pads?

Admiral CLEXTON. Testing facilities; yes, sir.

Mr. WEADOCK. I am sorry. I probably didn't make myself clear. I had reference to additional plant sites and machine tools and things of that nature.

Admiral CLEXTON. We have a program in my office which reviews all the requests for facilities and the type of facilities that have been given in the last year are only the type of the facilities that are so closely associated with research and development part of the missile that they must be given to that plant.

Mr. WEADOCK. You don't feel that the facilities for which you have granted certificates of necessity are of a nature that would serve to preclude a small business from acting as a subcontractor to the prime who had requested the facility from you?

Admiral CLEXTON. I don't believe so. We went to three of our largest prime contractors on this and asked them this specific question.

Mr. WEADOCK. Yes, sir.

Admiral CLEXTON. They stated it had no effect, that the facilities that had been granted them had no effect on their subcontracting program. I think their statistics prove this because they have had in the last several years their percentage of subcontracting running between 30 and 60 percent. It has run fairly steady except it is on an increasing basis. Let me give you some figures on one contractor, without naming the individual, who went from 40 to 47 percent, to about 50 percent in the 3-year period of subcontracting.

Mr. WEADOCK. Well, there would still be the possibility that if perhaps he had not been granted additional plant facilities it might run even higher. Not that that isn't certainly a satisfactory level, but of course our purpose, Admiral, in so recommending was to prevent situations occurring whereby prime contractors were granted exceedingly large contracts and thereafter began to self-produce items that historically they had no prior experience in. This even when there might be an adjacent machine-tool plant or small electronics company in the area that had not been granted any facilities by the Navy, they might have gotten the subcontract. Obviously the Navy is aware of this matter and we presume that these facility and tool applications are screened very carefully.

Admiral CLEXTON. We have done this throughout the year and will continue. It is all concentrated right in my shop and Mr. Bantz is completely familiar with it. We never allow anybody to get the general purpose tools that would have a tendency to keep them from using the subcontract system.

Mr. WEADOCK. Fine, sir. Thank you.

Mr. Secretary, the Department of Defense evidently left up to each military service the problem that the chairman listed in his letter to Secretary McElroy concerning security clearances. Now we have had the opportunity of reading Admiral Raborn's and Admiral Dixon's and Admiral Stroop's testimony. I don't think this matter is touched on very comprehensively by either of those gentlemen. I wonder if, in the interest of time, perhaps through Admiral Clexton, we could have made available to the committee a statement concerning the Navy's policy on plant security clearances?

Mr. BANTZ. Well, we will see that it is furnished.

(The information subsequently furnished follows:)

EXHIBIT 10 (a)

PROCEDURES TO BE FOLLOWED BY AN INDUSTRIAL COMPANY IN OBTAINING SECURITY CLEARANCE WITH THE DEPARTMENT OF THE NAVY

1. With respect to clearance procedures for small businesses as well as other types involved in classified procurement, the procedures are the same. Security clearances for facilities are contingent upon the needs of procurement. In order for a company to be cleared to bid on classified contracts of the Department of Defense, a procuring activity of one of the military departments or a prime contractor of one of the military departments must first express a desire to enter into negotiations with the company for procurement of a classified nature. Such

negotiations may result from a request for a specific proposal, an invitation to bid, or the direct solicitation of the procuring activity or prime contractor by the firm seeking business. In enclosure (1) which is a pamphlet published by the Department of Defense in October 1954, there is an item on page 11 which is pertinent to subject report: [1]

"May a company request a facility clearance?

"No. Because of the extensive costs involved in clearing a facility, governmental economy does not warrant clearing a facility until a definite need has been established by a procuring activity of the Government."

2. Once a clearance for a company is requested by a procuring activity, the mechanics of granting the clearance require approximately 2 to 6 months, on an average, depending on the degree of clearance required and whether or not an interim clearance is requested by the procuring activity. The procedures for granting facility clearances are the same in the three military departments and are prescribed in section II, part 1 of enclosure (2). Paragraph 2–100 of this regulation states in part, "This part establishes the procedures for granting security clearances to contractors' facilities where access to classified information is *required for contractual purposes.*" [Italic supplied.]

Mr. WEADOCK. Two further questions, Mr. Secretary. On page 5 you indicate in your closing paragraph "this compares with about 40 percent to small business for all Navy procurement." This isn't the "surprise" of the year for us; is it? You mean including first-tier subcontracting?

Mr. BANTZ. Pardon?

Mr. WEADOCK. You include first-tier subcontracting in that 40 percent?

Mr. BANTZ. Oh, yes. Surely.

Mr. WEADOCK. Turning back to page 4, Mr. Secretary, you state:

> In numbers of separate actions our direct awards to small business during the first 8 months of this fiscal year have amounted to nearly one-quarter of the total procurement actions taken under our missile program. In certain direct purchases under our missile program we have been able to make 100 percent set-asides for small business.

We are aware and quite pleased about the set-aside, (I believe it was for containers,) you have made in the Bureau of Ordnance. Have there been any other set-asides in addition to that?

Mr. BANTZ. I think the only place we have done it is in the Bureau of Ordnance.

Mr. WEADOCK. Just that one, sir?

Mr. BANTZ. Yes.

Mr. WEADOCK. I was hopeful that there might have been several more.[2]

Admiral DIXON. May I speak for the Bureau of Aeronautics?

Mr. WEADOCK. Certainly, Admiral.

Admiral DIXON. I am Admiral Dixon, Chief of the Bureau of Aeronautics. During the period of July 1957 to February 1958, there was $15 million approximately, which was set aside for the exclusive participation of small business.

Mr. WEADOCK. In the missile program, Admiral?

Admiral DIXON. No.

Mr. WEADOCK. This was airframe business?

Admiral DIXON. Airframe and missile both.

Mr. WEADOCK. There were some missile components involved?

Admiral DIXON. I would have to check that, sir, for particular application to missiles. I will have to check that.

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[1] DOD publication Questions and Answers on Safeguarding Classified Information available at U. S Government Printing Office, Washington 25, D. C., at 15 cents per copy.

[2] It was subsequently reported that two set-asides had previously been used and a third was then in process.

Mr. WEADOCK. I have no further questions.
Senator BIBLE. Thank you, very much, Mr. Secretary.
(The exhibits submitted by Mr. Bantz follow:)

EXHIBIT 10 (b)

OCTOBER 24, 1957.

From: The Assistant Secretary of the Navy (Material).
To: Chief, Bureau of Aeronautics; Chief, Bureau of Ordnance; Chief, Bureau of Ships; Chief, Bureau of Supplies and Accounts.
Subject: Defense small-business subcontracting program.
Reference: (a) NPD–34–107.
Enclosure: (1) Proposed letter to prime contractors.

1. The Defense small-business subcontracting program described in reference (a) has been operating on a formal basis for a little over a year. It is believed to be having some beneficial effect in helping to provide an equitable share to small business of Government procurements. Recent conditions well known to you, principally those involving the reduction of Government procurements, have already been felt among the small businesses of the country in the form of reduced subcontracting by our prime contractors. It is apparent that in many cases prime contractors are induced to perform themselves work which previously they were in the habit of subcontracting. This has brought an outcry of complaints and requests for assistance from small businesses throughout the country addressed to the Department of Defense and to Congress. The latter is insisting that the military services more closely control the subcontracting of prime contractors and do more to insure an adequate share for small business.

2. There are, of course, important restrictions upon the extent to which we can go in this regard. However, the Defense Small Business subcontracting program is believed to be an entirely valid approach to the problem and one that can have a substantial result if the prime contractors are frequently and forcefully made aware of our feelings in the matter.

3. Accordingly, I am proposing that a letter similar in substance and in directness to the enclosure be addressed by you to each of the prime contractors of the Department of Defense, the cognizance for whom under the subcontracting program is assigned to your bureau. If this letter is followed up by continuous evidences of interest on the part of your technical and procurement personnel, I am hopeful that the average prime contractor will think very carefully about the small business objective when he approaches his make-or-buy decision.

4. I would be happy to hear from you at any time on this subject.

F. A. BANTZ,
Assistant Secretary of the Navy (Material).

EXHIBIT 10 (c)

LETTER TO PRIME CONTRACTORS

GENTLEMEN: The purpose of this letter is to solicit increased attention to the Defense small-business subcontracting program. A similar letter is being sent to all of the major prime contractors of the Department of Defense who are assigned to Navy cognizance under the program.

Since the inauguration of the Defense small-business subcontracting program on a formal basis over a year ago, new conditions have arisen which make increased emphasis on this program a matter of great importance. The reduction in procurement by the military services which is now underway is being felt by small businesses throughout the country because of an increasing tendency on the part of our prime contractors to do work themselves which formerly has been subcontracted. Complaints and requests for help from the field have been heard in increasing number both in the Department of Defense and throughout Congress. The Congress is insisting that we make every effort to insure that small business continues to receive its fair share of Government contracts. At the same time the Department of Defense itself feels anxiety over possible reductions in the breadth and variety of its production base.

Participation in the Defense small-business subcontracting program has been entirely voluntary on the part of our prime contractors. This is as it should be. However, the Department of Defense must object to any absorption by any prime contractor of subcontract work which results in increased costs to the Government. Beyond this, we earnestly invite your attention to the broad economic goals of the Government's small-business program, the success of which ultimately affects the welfare of us all.

Your past support of the Defense small-business subcontracting program is much appreciated. It has been important. Your continued support of all of its aspects is urgently requested. It is also asked that among the many considerations which you must entertain in the course of a make-or-buy decision you include the objectives of the small-business program.

Please be assured I am always mindful of the many individual factors which you must constantly keep in mind in the management of your company. I would be happy to hear from you at any time as to how you feel the Navy should proceed in endeavoring to insure an equitable place in our economy for small business.

Sincerely yours,

EXHIBIT 10 (d)

SMALL-BUSINESS SUBCONTRACTING PROGRAM

ONM NOTICE 4285,
DEPARTMENT OF THE NAVY,
OFFICE OF NAVAL MATERIAL,
Washington, D. C., March 25, 1958.

From: Chief of Naval Material.
To: Distribution list.
Subject: Small-business subcontracting program.
Reference: (*a*) NPD–34–107 (small-business subcontracting policy and program).

1. *Purpose.*—The purpose of this notice is to obtain additional information on the success of the small-business defense subcontracting program.

2. *Background.*—In accordance with reference (a), the third semiannual report of small-business subcontracting is now due from most of the prime contractors participating in subject program. Taken with the preceding two reports it provides, for the first time, a reasonable basis for evaluating the overall effectiveness of the program. To date attention has been directed almost exclusively to the efforts of the prime contractors to subcontract to small businesses. Of considerable significance also is the small-business share below the first tier of subcontractors. It may now be opportune to gain an evaluation of small-business participation below the first tier.

3. *Action.*—On the occasion of the current annual evaluation required by NPD 34–107.6 and in addition to the usual points then covered, addressees are requested to arrange that a few representative prime contractors be asked:

(*a*) To explain increases or decreases in small-business share of subcontracting which the semiannual reports may reveal.

(*b*) To provide information as to how they arrive at their make-or-buy decisions where small-business subcontracting opportunities are present.

(*c*) To provide any information they have or can readily obtain as to small-business share at the second and third tiers of subcontractors flowing from the primes' subcontracting to both large and small business.

Prime contractors concerned should be reassured that the Navy will continue to adhere to its undertaking made at the outset of the program not to reveal the figures of individual companies. It should be explained that the purpose is to determine the overall effectiveness of the program and to gain more information on the problems involved. It is further requested that information copies of action correspondence and replies be provided to this Office, attention code M–31.

4. *Cancellation.*—This notice will be considered canceled when required action has been completed, and for record purposes on December 31, 1958.

E. M. FAGAN,
Assistant Chief of Naval Material (Procurement).

EXHIBIT 10 (e)

INDUSTRY BRIEFINGS ON RESEARCH AND DEVELOPMENT PROGRAMS

ONM INSTRUCTION 3920.1,
DEPARTMENT OF THE NAVY,
OFFICE OF NAVAL MATERIAL,
Washington, D. C., April 7, 1958.

From: Chief of Naval Material.
To: Distribution list.
Subject: Industry briefings on research and development programs.

1. *Purpose.*—The purpose of this instruction is to direct increased emphasis on acquainting small businesses with planned programs of the Navy for research and development and to establish certain additional means to this end.

2. *Background.*—Paragraph 1–318.2 of Naval Procurement Directives states: "Personnel of the Department of the Navy are responsible for actively seeking out and developing information concerning firms which have competence for research and development, particularly small business firms, and for utilizing such firms to the maximum practicable extent in Navy research and development work." Full and effective implementation of this responsibility is important to the Navy, not only to insure that the Navy's responsibilities under the small-business program of the Government are successfully accomplished, but also to insure maintenance and continual refreshment of our industrial base. While the existing means of technical procurement offices to carry out this responsibility are sound in concept they have not always been adequate in their effect. The small business share of Navy research and development contracts is decreasing and, more importantly, the small business share of that portion of Navy research and development contracts, which is considered to be within the small business potential, is also decreasing. Added effort is now needed. Of special importance is the understanding by procurement and technical personnel that most small businesses, not having facilities of their own for extensive independent research and development, have particular need to be kept informed on the direction of future Navy material interests in order that they may maintain themselves as capable suppliers within our industrial base. It is to the advantage of the Navy, consistent with military security and sound procurement, to provide small business with such information.

3. *Action.*—The following action will be taken by addressees:

(*a*) Procurement, technical, and small business personnel concerned will maintain complete familiarity with the provisions of NPD 1–318.

(*b*) Added attention will be given to those provisions of NPD 1–318 which require an active seeking out of new firms within the small business community. In this connection, attention is invited to paragraph 1–318.3d (1) wherein it is stated that "the search for sources may include advance publicity of the Navy's interest in specific fields of research and development."

(*c*) At least annually one or more classified briefings will be conducted in Washington at which the small-business community will be abundantly represented and at which the general research and development plans of addressees will be discussed in as much detail as is practicable. These briefings may be conducted separately by each addressee or together by one or more, and either the entire field of research and development may be covered at one briefing or it may be presented at different times according to subject or other practical division. Planning for these briefings will be accomplished by representatives of addressees under the chairmanship of a representative of the Office of Naval Material. As soon as practicable, addressees will notify this Office (code M–31) of representatives designated.

(*d*) Instruct all field representatives that upon request they will instruct small businesses as to the procedures required to bring their research and development capabilities to the attention of appropriate Navy bureaus. By information copy, all inspectors of naval material are likewise so instructed.

E. W. CLEXTON.

Senator BIBLE. Our next witness will be Admiral Raborn.

STATEMENT OF REAR ADM. W. F. RABORN, DIRECTOR, SPECIAL PROJECTS OFFICE, BUREAU OF ORDNANCE, DEPARTMENT OF THE NAVY

Admiral RABORN. Mr. Chairman, the contribution of small-business firms to the Polaris program has been a substantial one. As the program reaches the hardware stage, the role of small business will increase in size and importance.

The scope of the Polaris program requires that it be prosecuted through the use of prime systems contractors. Such prime contractors have the large labor forces and extensive resources required to accomplish the tasks assigned to them. Small business, however, has contributed greatly to the Polaris program.

The Special Projects Office has been aware of the potential of small business as prime contractors in areas ancillary to the work being performed by the major prime contractors. Wherever possible, therefore, prime contracts have been awarded to small-business firms under the Polaris program. The work awarded to prime contractors has included such effort as the development of prototype electro-optical alignment systems, engineering studies, graphic aids, human engineering studies and many other tasks.

Small business has almost limitless potential in its role as subcontractor to Special Projects Office prime contractors. To date, some 2,500 to 3,000 small-business firms have already received subcontracts from Polaris prime contractors. As the program reaches the hardware stage, an ever-increasing number of small-business subcontractors will be engaged in turning out myriads of components and sub-subassemblies for the Polaris program.

An illustration of small-business subcontracting can be seen in the orders placed by Lockheed Aircraft Corp., as the Polaris prime missile system contractor. This contractor, under Polaris prime contracts, has dealt with 901 vendors other than the 2 major Polaris subcontractors. Of these 901 vendors, 739 or 82 percent are small-business firms. And, of the dollars spent with these 901 vendors 73½ percent were spent with small business.

The contract function of the Special Projects Office is performed by the contracting offices of the Bureau of Ordnance and the Bureau of Ships. In the preparation of procurement requests to be processed by these Bureaus, Special Projects Office personnel select small-business firms if they are among the most technically qualified to perform the required work.

All procurement requests are cleared through the Offices of Small-Business Specialist of the respective Bureaus. These offices present for consideration small-business firms which are qualified to do the work involved. Wherever possible, the Special Projects Office utilizes qualified small-business contractors.

I personally have been very much impressed with the quality of work the small firms turned in. They have been eager to get aboard and they have turned in an extremely fine record.

In addition, there is a ready avenue in the Special Projects Office for the consideration of small business potential otherwise presented through the Small Business Offices. Representatives of small-business firms are constantly referred to program managers in the Special

Projects Office for discussions as to possible participation in the Polaris program.

I would say roughly 30 percent of my personal time is taken up interviewing representatives of firms who have prospective potentials. Yesterday, for instance, I placed as a potential vendor the Willamette Iron Works of Portland, Oregon, who came in and demonstrated to me and some of my technical experts that they had something which we think we can use. I referred them to the proper contractor to come to grips with the program which they desire to engage in.

Personnel of the Special Projects Office and the Bureaus' contracting offices are mindful of the valuable contributions which small business is able to make to the Polaris program. Every effort is therefore made to utilize the small-business potential.

Polaris prime contractors recognize the value of small-business firms as subcontractors and use them extensively. This has largely been done on a voluntary and self-policing basis, with constant emphasis being placed on small-business utilization.

The Polaris prime missile system contractor, Lockheed Aircraft Corporation, offers an example of the positive measures taken by prime contractors to award subcontracts to small business. In a printed instruction entitled "Small Business Policy," the contractor encourages purchase department employees to "make every effort to assure participation by small-business concerns to the extent that their capabilities will permit."

A small-business liaison officer has been designated in Lockheed's Missile Systems Division to coordinate placement of work with small business. Purchase department employees report to him, at monthly intervals, as to the division of purchase commitments between large and small business.

The contracting for the Polaris missile and immediately related hardware is performed for the Special Projects Office by the Bureau of Ordnance contracting office. Through this office, prime contracts have been placed with 39 contractors, who are classified as follows: 21 large business, 54 percent; 14 small business, 36 percent; 4 nonprofit, 10 percent.

It should be noted that prime contracts awarded to small business have represented less than 1 percent of the total contract dollar volume. This contrasts sharply with the substantial share of the Polaris subcontract dollar received by small business, and underlines that the major small-business participation is on the subcontract level.

Now, since this statement was prepared, one of our prime contractors, the Interstate Electronic Corp., has petitioned to be returned to the small-business category. When this is approved, the percentage of prime contracts awarded to small business would be increased to about 3 percent of the total dollar volume of that allocated to the Polaris missile and immediately related hardware.

Prime contractors in the Polaris program have awarded approximately 80 percent of their subcontracts to small business. The following statistics illustrate this trend. Lockheed, for instance, total subcontracts, 901, of which 739, or 82 percent, went to small business. The dollar percentage to small business is approximately 75 percent.

Aerojet General Corp.: 158 subcontracts; 131 of these are to small business. The percentage to small business is 83 percent and the dollar percentage is 74 percent.

Aerojet General (as a subcontractor to Lockheed) has a total of 155 contracts, of which 116, or 73 percent, are to small business. The dollar percentage to small business is 33 percent.

The Special Projects Office recognizes the valuable contribution which small business is able to make to the Polaris program. Every effort will be exerted to insure that small-business participation in the program will continue to be a major one, and one which will expand as the program grows.

That completes my statement, Mr. Chairman.

Senator BIBLE. Thank you, very much, Admiral Raborn, I think it would be helpful to the committee if you could indicate the dollar volume of those subcontracts in your statistics. I am not clear on that. It seems to me that you are giving a percentage, numberwise, and you indicate, if I understand you properly, that on prime contracts small business received 1 percent of the total dollar volume; is that correct? And you say this contrasts sharply with the substantial share of Polaris subcontract dollars received by small business. What percentage of the contract dollar volume, as compared to the total contract, does small business receive?

Admiral RABORN. They received about 10 to 15 percent of the total Polaris dollar, which is, roughly, half a billion dollars.

Senator BIBLE. They received roughly——

Admiral RABORN (interposing). Fifteen percent, sir, of the half-billion dollars that is going into small business. And the dollar value of the prime contractors in small business, if the Interstate Electronics petition to return to that state is approved, will be sharply increased to 3 percent of the total dollar volume.

Senator BIBLE. That is, as to prime contracts?

Admiral RABORN. Yes.

Senator BIBLE. The subcontractors received approximately 15 percent of the total dollar volume involved in the Polaris program?

Admiral RABORN. Yes, sir.

Senator BIBLE. What does the future portend percentagewise, in this field?

Admiral RABORN. I would judge, sir, as we get into the hardware phase, as Secretary Bantz has indicated, we will get out of the in-shop, research and development work, which is so necessary when we are trying to design these things, and the subcontract vendor dollar volume will go up.

Senator BIBLE. Increase from 15 to 20 or 25 percent?

Admiral RABORN. Well, it is hard to say, but it is going to go up sharply; yes, sir.

Senator BIBLE. What would you say the dollar figure was involved in the Polaris program? You used a figure——

Admiral RABORN (interposing). About half a billion dollars today.

Senator BIBLE. $500 billion?

Admiral RABORN. Yes, sir. This, of course, takes in many areas not in the missile program, per se, as you know.

Senator BIBLE. I recognize that.

Admiral RABORN. Yes. Ships and so forth.

Senator BIBLE. Thank you, Admiral. Mr. Stults?

Mr. STULTS. Senator, I just wanted to ask Admiral Raborn if there is an inevitable trend toward more subcontracting as missiles get into the hardware stage? Let me explain what I mean. As the

prime contractor needs one mock-up now, let's say, or one piece of a component, obviously, the small plant is best able to make one-of-a-kind items. As you get into production runs, and these go up into the nature of say, 500, 1,000, or 500,000 gadgets, perhaps small business loses its competitive advantage at that point; isn't that true?

Admiral RABORN. Well, under items, small items that you are manufacturing, this probably would be true. The number of Polaris missiles that would be built will never approach that large magnitude unless there will be a marked change. There would still be relatively few.

Mr. STULTS. So, you feel that the people that are making one of a kind will always have the competitive advantage or are likely to have that competitive advantage?

Admiral RABORN. I certainly do.

Mr. STULTS. The last 7 or 8 words of your statement are very encouraging ones. I wonder if it is your thought that you will force that expansion by expanding the role of the Government-furnished equipment by taking over what is now contractor furnished and breaking out and contracting for Government-furnished equipment?

Admiral RABORN. Would you please expand your question just a bit?

Mr. STULTS. Let us assume we will get the Polaris state of the art sufficient so we get into the hardware stage and, rather than telling Lockheed they have to develop every bit that works together in the Polaris, can we break it down into 7 or 8 different pieces, or 10 or 20 or 30? Then the Navy itself can let the contract out. Do you see that in the offing?

Admiral RABORN. I would think not so much. Lockheed will continue to be responsible for the missile as a whole, of course, and the subcontractors which are now providing these components will continue and will be increased because the in-plant research work and detail design work which is now so necessary will lessen and the hardware flow will be increased. Now, this is, as you know, an extremely complicated missile; that is, ballistic missiles are inherently complicated, and the desirability and absolute requirement are that they come together and be put together, made to function in proper relation one part to the other in the Lockheed missile plant, before they are issued for us. This will continue to be a requirement, a necessity.

Mr. STULTS. You do not feel that the prime is under their current responsibility to draw up specifications and detailed drawings, and will be able to do so in such a manner that you and the general public will have some idea of what is needed to put the thing together and make it work?

Admiral RABORN. Well, I am sure that our specifications are quite detailed and rigid. It is possible to get these skills together in one place under other banners than the Lockhead missile division, but these must be a unitized work force of comparable knowledge and skills or the thing won't work. This is one of the things we have to have—a good competent technical force, well-trained and with the skills that are required, each in these widely divergent technical fields. You have to have that as a unitized package someplace.

Mr. STULTS. Certainly, this committee doesn't want you to give it to the blacksmith around the corner. But you now have as sub-

contractors these efficient, effective, skilled, talented small-business men, as you point out, to about 15 percent of your contract dollars. But you also point out, and you know that the Government has very little control over the prime contractor-subcontractor relationship. If Lockheed really wanted to put this under its own roof, there isn't much you could do about it if it were going to spend its own money to do it. On the other hand, if you get this item sufficiently standardized, it occurs to me that perhaps the Navy could let prime contracts where you would have an ability to earmark it for small business or to increase at least the competition so you might get better prices or even a better item.

Admiral RABORN. I certainly appreciate the truth of your remarks to this extent that we are aware of our responsibility to prime contractors to insure that they do not engage in practices which are contrary to the will of Congress. Lockheed Aircraft Corp., since we are talking about that company, have been singularly sensitive to the demands placed on it by the congressional action and exercised through the Department of Defense. I have before me the job instruction which sets forth in some detail and even quotes the Department of Defense instructions. So Lockheed employees have before them the necessary regulatory papers and instructions which give them well-defined guidelines, and they have set up an organization to insure that their actions comply with these guidelines.

Now, as for our responsibility, we have resident naval officers, inspectors, who are cognizant of their action on a daily basis. As for our contracting officer, wherever we can have material purchased on a competitive basis, we invariably do this because, of course, it is to everyone's advantage. We get better quality and lower prices.

Mr. STULTS. Thank you.

Senator BIBLE. Admiral Raborn, just one further question. I know that you are very well aware of the interest of the Small Business Committee in procuring a larger percentage of subcontracting for small business. I think that is very apparent. You indicate that you are making every effort. How do you, as an Admiral and Director of this special projects field, specifically exert that effort on Lockheed, for example? What do you do? How do you evidence your interest to see that they place more subcontracts with small business? How do you do it?

Admiral RABORN. Principally, sir, through the mechanism of the contracts issued by the Navy Department, the Bureau of Ordnance to the contractors, and it is written right in the contract. I have here a paragraph that states that, and in every contract that is issued you have these provisions as mandatory requirements which the contractor has to live up to.

Senator BIBLE. What is the mandatory requirement?

Admiral RABORN. They, in effect, set forth the Department of Defense instructions as to prime contractors which are contained in the Department of Defense Instructions No. 4100.20 dated April 9, 1955, and it says as follows:

> It is the declared policy of the Department of Defense that a fair proportion of the total purchases and contracts for supplies and services for the Department of Defense shall be placed to small-business concerns whether prime contractor, subcontractor, or suppliers. And with respect to subcontracting, this will be accomplished by measures designed to insure that small business concerns are

afforded an equitable opportunity to compete for such contracts within their capabilities.

Senator BIBLE. How do you implement that? That sounds good. It might be just a platitude. Are there any teeth in it? Do you follow through? Do you call in Lockheed and say, "It doesn't appear to us that small business is getting its just share under the contract"? What do you do, specifically, you or those under you, whoever it is that handles this?

Admiral RABORN. Yes. There is a department in the Lockheed missile division that scrutinizes all contracts and all purchase orders. It has to clear through this Department to make or buy and then when it is "buy" it has to be cleared through the small-business liaison officer to see if it falls into small business. This is every item. This is every purchase order. I have here the instructions which they have issued and which they require compliance with. This is in Lockheed. And they define who the small business, small suppliers are. They are defined as those who employ less than 500 people. Representatives of potential vendors and subcontractors solicit Lockheed business. It is this person's and this office's responsibility to determine whether this concern is large or small. This is kept on a current file there.

Senator BIBLE. How often do you review those percentages? Do you do it just before this committee meets, or do you do it monthly or quarterly, or when?

Admiral RABORN. This is reviewed monthly, sir.

Senator BIBLE. I am only asking the questions to try to determine exactly how you impress big business to give small business a just share. How do you do it?

Admiral RABORN. This is reviewed monthly by the Lockheed top management, which of course, is kept current there. It is reviewed monthly. My representative there also reviews it monthly and my office back here, through the contracting officers of the Bureau of Ordnance, receives these reports.

Senator BIBLE. Admiral, over the course of the last year, has your office had occasion at any time to call in the proper division of Lockheed and say, "well now, it occurs to us that you are not giving small business its just share"? Have you specificially said that at any time during the past 12 months?

Admiral RABORN. I am very happy to say that we have not had occasion to do this because they are extremely sensitive, as I mentioned previously, to the part which small business can play in this.

Senator BIBLE. They are sensitive to it, but I am advised that 15 percent seems to be a lagging figure as compared to placement of subcontracts in the other services and in other Navy programs. I mean, do you take their word that they are sensitive to it or if they say, "well, 15 percent is correct," do you let it go at that?

Admiral RABORN. No, sir; this is part of the contracting officer's responsibility in supervising the execution of the provisions of the contract. This is a matter of daily business in supervising these contracts.

Senator BIBLE. Well, I just want to impress upon you our keen interest in seeing that you are continually vigilant and that you exert increasing efforts to see that a larger percentage does find its way to small business in the field of the subcontracts. Mr. Weadock.

Mr. WEADOCK. Admiral, if it doesn't violate security requirements, just how large is the Special Projects Division that you direct—manpowerwise?

Admiral RABORN. We have a rather small managerial firm, relatively small. We have a board of about 71 officers and about twice that, 180 civilians. Our purpose is to give top management direction through the existing bureaus and agencies in the Government and in civilian firms for the prosecution of this program.

Mr. WEADOCK. Yes, sir. Your contracting and purchasing activities, they are accomplished for you either by BuOrd or BuShips. You don't have purchasing and contracting people in your division or in your projects office?

Admiral RABORN. No, sir; they are provided to me by the Bureau of Ships and the Bureau of Ordnance.

Mr. WEADOCK. The normal procedures that have been established within the Department of Navy, the safeguards for small business, would probably be a responsibility that Mr. Lenahan and Mr. Chemsak perform for you. They perform that for you; is that right, sir?

Admiral RABORN. That is right.

Mr. WEADOCK. Are you familiar with those gentlemen?

Admiral RABORN. Yes, sir.

Mr. WEADOCK. Fine. One other question, Admiral. At the bottom of page 2 regarding how you get in touch with technicians about the preparation of the procurement requests, you state there—

> that Special Projects Office personnel select small-business firms if they are among the most technically qualified to perform the required work.

Now, are these your technicians that select these small-business firms?

Admiral RABORN. This is intended to convey the thought that they refer small-business firms to our contractors. We bring these to the attention of our contractors, as I did yesterday, for example, with the Willamette Iron Works. Their manager came in to see me and to find out the nature of our work in order to see if he could fit in. Now, I referred him to a specialist at the Naval Gun Factory who had recently made a nationwide survey of a certain work area in which I thought that this particular firm might have some technical potential. Based on his talking with my technical expert or the technical expert at the Naval Gun Factory, it seemed both to him and to me that the Willamette Iron Works could do some work for us. I referred him then to Aerojet General Corp. with a recommendation that they get together on a technical level.

Mr. WEADOCK. That concerns subcontracting. In your statement you say here: "In the preparation of procurement requests to be processed by these bureaus," meaning the Bureau of Ships or Ordnance—your personnel select the small-business firms. These firms that you select—do you then recommend to the Bureau of Ordnance and the Bureau of Ships that these fellows look like pretty good fellows and they are small but I think they can do a pretty good job and we want you to go out and get in touch with them? Is that what your technicians would do?

Admiral RABORN. Yes, sir; in some cases. Mind you, in our specialized task in our organization, we give prime technical management to the development of the program as a whole. The Bureau of Ships specialist and the Bureau of Ordnance specialists actually pass

on the ability of contractors to perform this work based on their staffs which are set up for this purpose. I hope I made myself clear.

Mr. WEADOCK. We are getting to the point, Admiral. I think one thing that we probably would object to, however, is where you continue on in that statement and say that they select the small-business firms "if they are among the most technically qualified." Now, in this area that we are dealing with, that is, missiles, I think a company could probably double its efficiency in the short span of, say, 3 months, with the acquisition of new engineers and additional financial resources. I would be happy if you would take out this one qualification about the "most technically qualified." I think some of them are equally qualified technically with big business. I think that might be an unfair hardship you are burdening them with. We would rather have your technical people say we have checked these people out 500 ways from Sunday and they seem to have a good personnel structure and seem to know what they are doing, so let's give them a look. Do you think we could eliminate that qualification which seems to indicate that for you to even consider a small firm it has to be at the top of the ladder? But then, I don't know whether you similarly qualify it for the larger firms.

Admiral RABORN. Well, we certainly do. Our job is and has been to get together the most efficient team, contracting team, to perform this most urgent, highest priority project in the shortest possible time scale in the most efficient way. Efficient both as to performance and expenditure of public funds. I meant to imply in this statement that we favor small firms if their workload and technical capability will permit them to engage in this work.

Mr. WEADOCK. That is right. Thank you.

Senator BIBLE. Thank you, very much, Admiral Raborn. I am advised that you do have a morning commitment and I am certain it is all right with the committee for you to be excused at this time.

Admiral RABORN. Thank you sir. I am grateful for this opportunity.

Senator BIBLE. We appreciate you being here and I will now turn the meeting over to Senator Smathers.

Senator SMATHERS. Thank you very much, Senator Bible. The next witness that we have is Rear Adm. Stroop, Chief of the Bureau of Ordnance of the United States Navy.

STATEMENT OF REAR ADM. PAUL D. STROOP, USN, CHIEF OF THE BUREAU OF ORDNANCE; ACCOMPANIED BY CAPT. M. A. PETERSON, USN, ASSISTANT CHIEF OF THE BUREAU FOR MATERIAL; CAPT. W. A. WALTER, USN, DIRECTOR OF THE CONTRACT DIVISION; CAPT. L. M. SLACK, USN, SYSTEMS DIRECTOR FOR GUIDED MISSILES, RESEARCH DIVISION; J. F. LENAHAN, SMALL-BUSINESS SPECIALIST FOR THE BUREAU

Admiral STROOP. I have a prepared statement, which I am prepared to read.

Senator SMATHERS. All right, sir, you go right ahead.

Admiral STROOP. Mr. Chairman and members of the subcommittee, I appreciate this opportunity of discussing with you the guided missile procurement program of the Bureau of Ordnance and,

more particularly, the extent to which qualified small-business concerns may be able to participate in this program. As you know, I have recently relieved Rear Adm. F. S. Withington, USN, as Chief of the Bureau. Since succeeding him, I have had an opportunity to familiarize myself, generally, with what has transpired in the Bureau during the interim since March 1957, when I completed my tour of duty in Washington as Deputy Chief of the Bureau. I have noted with much interest the progress of the Bureau's small-business program. I want to assure you that it is my intention to support fully this program in the same creditable fashion as did my predecessor and, additionally, to exert every reasonable effort to improve our performance in this regard wherever it is practicable to do so. I have recently made this intention known in writing to my division directors and the commanders of ordnance field installations under my technical direction.

I will not burden you gentlemen with a detailed restatement of the Bureau of Ordnance small-business policy and procedures. I believe this subject was discussed in some detail before your subcommittee on July 12, 1957, and is recorded in the official transcript of that hearing. I would like to add only that all procurements having to do with our missile programs are accorded a searching review by our small-business specialist and Small Business Administration liaison officer to insure that maximum opportunity is afforded qualified small-business concerns to participate therein.

The Bureau of Ordnance has under its cognizance design, development and production of the following guided missiles: Sidewinder, Talos, Terrier and Tartar. The Polaris Intermediate Range Ballistic Missile is under the direction of the Special Projects Office which is associated with the Bureau of Ordnance. My discussion will relate to the first-mentioned missiles. During fiscal years 1956, 1957 and the first half of 1958, the Bureau of Ordnance, in implementing its missile programs, has obligated about $800 million. The obligations of the Bureau for the second half of fiscal year 1958 and for the fiscal years 1959 and 1960 are expected to total approximately $1 billion.

Missiles and their associated components are among the most highly complex items that have been purchased by the Bureau of Ordnance. The rapidly changing state of the art in missile development tends to project the research and development phase so that it virtually parallels production. Obviously this condition has a limiting effect upon the timely introduction of competitive sources for the production phase. However, the greater risk, technologically and economically, of producing an obsolete weapon in quantity is materially reduced by projecting research and development work well into the production of missiles.

In the procurement of missiles, the Bureau of Ordnance has followed a modified approach to what is known as the weapon system concept; the extent of modification being determined by the complexity and ultimate use of the particular weapon in question. Compatability requirements of weapon systems dictate that coordination responsibility for the elements thereof be definitely fixed, particularly during the research and development phase. Accordingly, a lead contractor is selected for this purpose; however, the Bureau may contract directly with other sources for the furnishing of specialized

research and development services. In the production phase the major components of the system such as guidance and control package, fire control equipment, launchers, propulsion units, special handling and packaging equipment, are being procured directly from individual sources. In the three missiles which are presently in production, Terrier, Talos and Sidewinder, prime contract responsibility has been widely spread between various commercial concerns and Government activities. The statistical data previously filed with this subcommittee indicate the following spread of prime contractors during the fiscal year 1956, 1957 and the first half of 1958:

This is the tabulation: Terrier, large contractors 14, small 6; Talos, large contractors 14, small contractors 3; Sidewinder, large contractors 16, small contractors 6.[2]

There is no doubt that the prior existence of specialized facilities within the Naval Ordnance Establishment has significantly influenced the pattern of our missile procurement. Such installations as the Naval Ordnance Laboratories and Naval Ordnance Test Station were uniquely qualified to perform much of the initial development work which underlies these new weapons. The Naval Mine Depot and certain of the naval ammunition depots are singularly equipped to perform the final assembly, loading, and checkout functions required before the missiles are to be issued to the fleet. The Naval Gun Factory has in place much of the heavy facilities required to manufacture shipboard launcher equipment. In this connection, it should be noted that these activities depend almost exclusively upon small-business vendors in their localities for the support necessary to carry on their operations.

We believe that definition or identification of the small-business potential would be premature during the evolutionary stage of these weapons. Moreover, to do so at this time might have a restrictive effect on the breadth of consideration to be given small-business concerns because it would necessarily be based upon the limited experience to date. We say this because we have advantageously used the facilities and services of highly competent firms in the small-business category in both the research and development and production phases, and based thereupon we are not persuaded that all of the specialized know-how required for the improvement of these weapons resides exclusively with the larger companies. For example, very important contributions were made by small-business concerns to the initial research efforts conducted by the Applied Physics Laboratory

[2] Following is supplemental information furnished by Bureau of Ordnance, Department of the Navy:

DEPARTMENT OF THE NAVY
BUREAU OF ORDNANCE
Washington, D. C.

MAY 6, 1958.

From: Small Business Specialist, Bureau of Ordnance, Department of the Navy.
To: Staff counsel, Military Procurement Subcommittee, Senate Select Committee on Small Business.
Subject: Supplementary information in connection with Chief, Bureau of Ordnance, testimony before Military Procurement Subcommittee of the Senate Select Committee on Small Business, May 1, 1958.
Reference: (a) Telecon from Mr. J. F. Lenahan, Bureau of Ordnance, to Mr. R. Weadock, staff, Military Procurement Subcommittee of Senate Select Committee on Small Business, May 1, 1958.

1. As pointed out in reference (a) the prime contract spread for the Terrier and Talos Missiles indicated on page 3 of Rear Admiral Stroop's prepared statement issued on May 1, 1958, pertained only to the missile proper and did not include such major support equipment as launchers and fire-control gear.
2. As you know this equipment is part of the missile system and represents a very substantial portion of the dollars expended in missile procurement by this Bureau.
3. Accordingly, the number of prime contractors, page 3 of Rear Admiral Stroop's prepared statement should be increased as follows to reflect inclusion of the support equipment:
Terrier: 15 large, 4 small. Talos: 4 large, 3 small.

J. F. LENAHAN.

of the Johns Hopkins University and the Naval Ordnance Test Station in the development of our principal missiles. Specifically in the field of missile propulsion and rocketry two small concerns made outstanding contributions. Other specialized small-business firms have performed with distinction in such diverse fields as target detection and recognition, manufacturing techniques for radomes, shipboard handling equipment, booster-missile separator mechanisms, optics and infrared components, and telemetering equipment. In production one particularly talented small business has developed into a principal supplier of boosters, sustainers, and warheads for various of our missiles. This firm entered our missile program with a development contract in 1951; since that time it has received 23 additional prime contracts aggregating $15,600,000, more than quadrupled its employment and opened a second plant. Some months ago a requirement for the first production quantity of Sidewinder containers was generated. This procurement was set-aside for small business and an award in the amount of $1,300,000 was made to a small mid-western concern. Other small companies are fabricating auxiliary items such as special handling equipment and special test equipment. Detailed information concerning these and other specific contract awards is already on file with this subcommittee.

In the subcontracting area, it is apparent that the immediate potential for small business is substantially larger both in items and dollar value. Our efforts, in cooperation with our prime contracts, to develop and expand this potential have been encouraging as is evidenced by the attached summary covering fiscal years 1956, 1957, and the first half of 1958 received from our six principal missile contractors including producers of propulsion units and launching equipment. This summary indicates that small business at the first-tier subcontractor level received an average of 47 percent of the total dollars subcontracted.

(The document referred to follows:)

EXHIBIT 11

Summary of subcontracting by six principal missile prime contractors to the Bureau of Ordnance during the period fiscal years 1956, 1957, and the first half of fiscal year 1958:

	Percent subcontracted	Percent of subcontracted dollar awarded to small business
Prime contractor:		
A	52.0	74.0
B	68.0	24.0
C	45.0	27.0
G	68.6	29.1
N	28.0	66.0
P	50.0	60.0

I am convinced that small-business participation in missile procurement is of such importance to us from the viewpoint of improved technology, mobilization requirements, and cost control that we would be constrained to pursue its development vigorously for these reasons alone apart from any considerations of the formalized small-business program. In furtherance of this objective we have recently devised a system whereby our technical programs can be broken down into

technological categories. This system will facilitate ready recognition by interested sources of the type of work required. Additionally, we plan to disseminate analyses of our various research and development programs in order to attract the hitherto unknown potential of the smaller research and engineering companies. Conversely, working with the small-business specialist for the Bureau of Ordnance our technical people will be able to evaluate more effectively the capabilities of individual small concerns by relating them to the specific requirements of planned programs.

I would like now to identify the members of my staff who have accompanied me here today and who will be here to answer any questions you may have in their specific areas.

Capt. M. A. Peterson, United States Navy, Assistant Chief of the Bureau for Material; Capt. W. A. Walter, United States Navy, Director of the Contract Division; Capt. L. M. Slack, United States Navy, Systems Director for Guided Missiles, Research Division; Mr. J. F. Lenahan, small-business specialist for the Bureau.

I might say Mr. Lenahan works very closely with me and he is one of my personal assistants and has direct access to my office. He does not channel through other division directors.

Senator SMATHERS. Thank you very much, Admiral. I would like to say it is a very encouraging and openminded statement. It is one of the most encouraging ones that we have had in respect to small-business activity in what otherwise amounts to the big-missile field. I also want to say that we have been very much aware of the work of Mr. Lenahan. He has cooperated with the staff of our committee and we have heard of not only his great interest but his splendid and constructive work in this field.

Senator Thye, do you have any questions?

Senator THYE. I have no questions, Mr. Chairman, but I do wish to commend the Navy for a splendid job of endeavoring to spread the contracts out amongst the small-business people and the small-business concerns. I believe that you have the best record. You have gone up in the percentage with small-business firms in this calendar year, according to the record made here this morning. That is a most encouraging outlook, because the small-business man is hard pressed as we find it throughout the central Midwest. Thank you, Mr. Chairman.

Senator SMATHERS. We are delighted to have the chairman of the full committee, the Honorable John Sparkman, and we will ask the Senator if he cares to ask any questions?

Senator SPARKMAN. Thank you, Mr. Chairman. I am sorry I was not here for the entire statement but I just couldn't get here.

Senator SMATHERS. Counsel Weadock, do you have any questions?

Mr. WEADOCK. Yes, sir, I do. Admiral, on the first page of your statement you indicate that you have charged your people to make—

> every reasonable effort to improve our performance in this regard wherever it is practicable to do so.

And you state:

> I have recently made this intention known in writing to my division directors and the commanders of ordnance field installations under my technical direction.

Would you be kind enough, sir, to give us a copy of the instructions that you have sent out?

Admiral STROOP. Yes, sir. I have a copy here.

Mr. WEADOCK. All right, sir, we will accept that for the record, if there is no objection, Mr. Chairman.

(The document referred to follows:)

EXHIBIT 12

BUREAU OF ORDNANCE SMALL-BUSINESS PROGRAM

DEPARTMENT OF THE NAVY
BUREAU OF ORDNANCE
Washington, D. C.

APRIL 25, 1958.

From: Chief, Bureau of Ordnance.
To: Distribution list.
Subject: Bureau of Ordnance small-business program.
Enclosure: (1) Copy of small-business program circular issued by ONM on March 19, 1958 (transmitted herewith for information).[1]

1. I have been reviewing our small-business program to determine not only its effectiveness but also whether or not the dollar results truly reflect best efforts on the part of all hands within the Bureau of Ordnance.

2. I have noticed, to my surprise, that the percentage of total procurement dollars placed with small-business concerns has declined from 14 percent in fiscal year 1955 to 7.5 percent at the close of fiscal year 1957. Perhaps even more alarming is the fact that the 7.5 percent figure for fiscal year 1957 has been further reduced to 2.2 percent of total dollars for the first 8 months of fiscal year 1958. Unquestionably, a good bit of this decline is properly attributable to the change-over from conventional weapons and ammunition to the more complex weapons systems. However, I am of the opinion that, if highly qualified small-business concerns were given the opportunity, they could make substantial contributions both in the development and in production phases of the newer weapons programs. We have advantageously utilized such concerns in connection with our missile programs and I believe further utilization could be beneficial to the Bureau as well as to the small-business community.

3. Accordingly, addressees are advised that as a matter of sound policy, the Bureau of Ordnance will continue to support the Navy small-business program to the maximum extent practicable consistent with assigned objectives and good procurement practice. Your immediate attention and the fullest cooperation of your assistants are essential for the implementation of this policy. The Bureau's small-business specialist (Mr. J. F. Lenahan, extension 64972, room 3006 of the main Navy Building) is available to render assistance wherever required in connection with your prosecution of this program.

PAUL D. STROOP.

[1] Retained in Committee files.

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NOP, Forest Park, Ill., Capt. H. L. Jukes, USN
NAD:
Fort Mifflin, Pa., Lt. Comdr. P. S. Hurry, USN
Hastings, Nebr., Capt. R. A. Thacher, USN
Hawthorne, Nev., Capt. R. M. Farrell, USN
Hingham, Mass., Capt. B. W. Freund, USN
NPF, Indian Head, Md., Capt. G. E. King, USN
NEODTC, Indian Head, Md., Comdr. R. W. Eigell, USN (OIC)
NAVTORPSTA, Keyport, Wash., Capt. W. B. Moore, USN
NOU, Key West, Fla., Comdr. R. D. Ward, USN
NOP:
Louisville, Ky., Capt. H. N. Larson, USN
Macon, Ga., Capt. R. L. Neyman, USN
NAD, McAlester, Okla., Capt. O. C. Robbins, USN
OSO, Mechanicsburg, Pa., Capt. W. E. Moring, USN (SC)
NND, Melville, R. I., Comdr. D. F. Larkin, USN
CENTORPOFF, Newport, R. I., Comdr. J. G. Messer, USN (OIC)
NUOS, Newport, R. I., Capt. H. S. Monroe, USN
NOP, Pocatello, Idaho, Capt. W. R. Lefavour, USN
NAND, Seal Beach, Calif., Capt. T. K. Bowers, USN
NAD, Shumaker, Ark., Capt R. E. Johnson, USN
NOP, South Charleston, W. Va., Capt. R. H. Crane, USN
NAD, St. Juliens Creek, Va., Capt. W. C. F. Robards, USN
NND, Tiburon, Calif., Comdr. V. C. Langan, USN
NGF:
Washington, D. C., Rear Adm. D. M. Tyree, USN (superintendent)
(Piney Point Annex), C. W. O. 3 J. H. Dotterer, USN
NOL, White Oak, Md., Capt. W. W. Wilbourne, USN
NOMTF, White Sands Proving Ground, N. Mex., Capt. F. D. Boyle, USN
NOP, York, Pa., Capt. R. H. Solier, USN
NMD, Yorktown, Va., Capt. O. D. Waters, Jr., USN
NMEF, Yorktown, Va., Comdr. J. D. Jeffords, USN

BUREAU OF ORDNANCE DIVISION DIRECTORS

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B	FI	MA	RE
AD	IN	PL	SP
CO			

Mr. WEADOCK. On page 3, sir, you indicate—

the prior existence of specialized facilities within the Naval Ordnance Establishment has significantly influenced the pattern of our missile procurement.

Now, we certainly can take no exception to the pattern of your missile procurement whereby you have given small firms under Terrier, 6 prime contracts, under Talos 3; and under Sidewinder 6.[3]

[3] See footnote 2 on p. 130 (letter from J. F. Lenahan, Bureau of Ordnance).

Mr. Holaday, who testified here the first day of the hearings, indicated that we can characterize missile development as first generation production, the second generation in the researching stage and the third generation that we can look forward to in perhaps a decade. Do you think that your research facilities, Admiral, have aided the Navy or your bureaus to get a better jump on other services? You seem to have proceeded, sir, to the hardware stage that we find may be the goal or target for the small-business man. Everyone indicates to us that when we reach this hardware stage that perhaps prime contracts can be let to the smaller businesses; now because of what we cannot help but feel is an outstanding achievement in your giving prime contracts to the smaller business, we would like to find the key to this and perhaps you can help us.

Admiral STROOP. I think perhaps the answer to that is that ordnance procurement is somewhat unique in that you have never had in this country a large industry devoted to making ordnance items. We have never had a Krupp industry. Both the Navy Ordnance and Army Ordnance have had to buy bits and pieces historically and assemble them. That of course accounts for the facilities we have throughout the country, the Naval Ammunition Depot and the Naval Mine Depot and our 6 ordnance plants. It is only natural when we went into guided missiles that this type of an attack would be brought into the problem. Quite frankly, we have managed to make it work rather well and I think costwise we have done pretty well. The Navy's guided missile program, I think is outstanding if you analyze it dollarwise or if you analyze it performancewise. If you analyze it for technical excellence, I think, you will find the Navy's guided-missile program is good. The proof of this is the fact that we have outside customers. For instance, the missile Sidewinder is being bought in considerable quantities by the Air Force. I think they will wind up by using more than the Navy does. The missile Talos has excited interest in other services and even in other nations. It is the same way with the Terrier. I don't claim that our method of procedure is the best one but it was the method of procedure that we got into because we had the facilities and we had experience in working this way. It has paid off.

Mr. WEADOCK. Admiral, would you say that there may be some analogy between the Bureau of Ordnance and some of the private company weapon systems contractors. In other words, if you are letting in the case of say, one of your missiles, Terrier, if you let 20 prime contracts in the Bureau of Ordnance for the Department of Navy, I presume this refers to various units like propulsion and guidance and what have you. This places you very much in the role of a weapon systems contractor, does it not?

Admiral STROOP. That is correct, sir.

Mr. WEADOCK. Is there any reason of your own knowledge why you have been able to accumulate such skilled people to put yourself in this position, where we seem to have some difficulty in some of the other services, let's say, generally, who indicate to us that they do not have the skills inherent in the military to act in this capacity? We find this a very encouraging thing, Admiral, to be quite candid.

Admiral STROOP. I think I can refer back to my testimony just a few minutes ago. Ordnance is unique in that we have had to buy bits and pieces and assemble throughout the years. This has been true for

over a hundred years in the ordnance game. Therefore, we have built up these skills. I must admit though, as we get into these very complicated guided missiles that we are having to go out and buy larger pieces. We just simply cannot afford to keep these skills available completely in the Bureau of Ordnance and we are going out and buying larger packages than we used to.

Mr. WEADOCK. To counteract that, on page 5, you indicate some of the things that you are doing internally that we think are very constructive.

Mr. Chairman, it is very hard to question the admiral in view of the excellent record he has shown here.

Senator SMATHERS. I will say, thank you, very much, Admiral. It is a fine statement.

Senator SMATHERS. Our next witness is Admiral Dixon, Chief of the Bureau of Aeronautics.

STATEMENT OF REAR ADM. ROBERT E. DIXON, CHIEF OF THE BUREAU OF AERONAUTICS, ACCOMPANIED BY CAPT. H. O. HAUCK, DIRECTOR, GUIDED MISSILES DIVISION; COMDR. D. S. GOOD, SMALL-BUSINESS SPECIALIST; COMDR. FRANK N. COLENDA, PRODUCTION DIVISION; AND MR. JAMES S. TASSIN, ASSISTANT DIRECTOR, CONTRACTS DIVISION

ADMIRAL DIXON. Mr. Chairman, I have my statement that I can either read——

Senator SMATHERS (interposing). Why don't you just read it, if it is right there.

Admiral DIXON. All right.

I am Rear Adm. Robert E. Dixon, Chief of the Bureau of Aeronautics. I am pleased to be able to participate in your committee's annual review of the progress of our programs designed to insure that the small-business community obtains its fair, equitable share of our procurement dollars, with special emphasis, today, on procurement in the missile field.

Secretary Bantz and others have spoken to the overall policy of the Navy Department in this area. As chief of a Material Bureau, I shall confine myself to reporting what we have been able to plan and carry out in the actual procurements of those missiles for which we are responsible.

These are Sparrow III, an air-to-air weapon, Corvus, and Bullpup, air-to-surface weapons, and Regulus I and II, surface-to-surface weapons.

My Bureau is not equipped with a sufficiently large staff of engineers, draftsmen, or designers necessary to produce a new weapons system. Therefore we must go to industry, make known to them our requirements, and then direct and monitor their efforts to bring a new weapons system to fruition. It continues to be our conviction that we must give the missile contractor prime responsibility for the whole job. We cannot tolerate the dilution of effort which would result were we to assign different parts of the job to different contractors, nor the endless time loss that would result from the periodic meetings that would be necessary to insure design compatability of the various components and parts made by the different companies.

This, in our experience, wastes time, money, and manpower which we can ill afford to squander.

The result, then, is the award of our prime contracts to those firms which have the capacity, and can assume the responsibility, for producing a complete missile. Operations of this nature require engineers in the hundreds, tools costing in the millions, space in the hundreds of thousands of square feet, strong management, and stable financial resources. In effect, they preclude small business from participation at this stage of procurement.

Small business can be most effectively utilized, in our experience, at the next stage in the procurement cycle: when the subcontracting process is undertaken.

At that point, small contractors, literally by the thousands in our case, begin to reap their share of the missile defense dollar. For example, the Raytheon Manufacturing Co. is the prime contractor on Sparrow III, our supersonic air-to-air missile. The cost of this program approximates $100 million a year. Let me give you their figures on subcontracting, and their impact on small business. The Raytheon Co. has established a "make or buy" committee, which determines whether the company itself will do a given portion of the Sparrow job, or will subcontract it. Its decisions in the past 3 years have resulted in subcontracting approximately 59 percent of the dollars they receive from the Navy. In 1956, based on a program cost of approximately $30 million, small business got 48 percent of the subcontracted amount, or approximately $7 million; in 1957, 59 percent; and in 1958 to date, 56 percent. A rough approximation for the 3 years would be $75 million. We look for the percentages to remain in the same general range for the foreseeable future.

This company, like our other prime contractors utilizes small-business concerns for a variety of reasons. The most important of course is the small-business contractor's proven ability to deliver goods economically, well made, and on time. We believe, too, that our own aggressive program of stimulating the prime's activities in this field is largely responsible.

As you know, we staff a full-time Small Business Office. The head of that office is Comdr. Dale Good, who reports directly to me. It is the function of the Small Business Office to review all procurement actions, to interview and counsel with small business on Bureau procurement procedures, and to monitor the subcontracting programs of prime contractors which have accepted the Department of Defense small-business concept. With his assistant Mr. G. W. Wilson, Commander Good spends a substantial portion of his time reviewing with prime contractors their policies on small business and obtaining their concurrence in the adoption of the Navy small-business program. I am particularly pleased to state that all of our missile prime contractors, like all of our airframe contractors have now agreed to this program.

Since the armed services procurement regulations sharply define the limits to which the Navy may legally go in implementing the small-business program by directives to our contractors, ours is in general a policy of training, guidance, and salesmanship, our product a voluntary agreement on the part of the contractor to participate in the program.

We hold seminars for our senior people in the field—at Los Angeles, Dayton, Ohio, and New York City. We make the small-business program an important topic on the agenda of our field contract administration seminars, held in the Bureau for our field personnel. We make education in the aims of the small business program a special part of the training of each of our program officers. These men carry overall responsibility for each of our weapons systems and, in effect, lead the Bureau team which works on the development and procurement of each.

Necessarily, we are more successful with some prime contractors than with others in the percentages we achieve of small-business participation. This stems from several reasons, to each of which we try to remain alert. In the initial stages of a design contract, when the project is still primarily an engineering one, the prime contractor will normally utilize his own design team. At that stage, relatively little subcontracting can be expected. As it progresses to the hardware stage, more subcontracting in is order and we move in to encourage the prime contractor to engage the services of small business. Our Corvus missile, for example, started its career in 1956; 2.6 percent of 1957 Corvus money, some $40,000, went to small business and 5.12 percent of 1958's.

Mr. STULTS. Excuse me. Is that prime contracting or subcontracting?

Admiral DIXON. This is the total money to the prime.

Mr. STULTS. Then the prime to the subcontractors, they are just 5 percent?

Admiral DIXON. That is right.

We expect the percentage to improve against next year. It will reach a somewhat smaller top figure than some other missiles. This is due primarily to the fact that the prime contractor, the smallest prime contractor with whom we deal, is so constructed, companywise, that he has to deal with relatively large subcontractors equipped to take on major component jobs in their entirety. I point this up to emphasize that the award of prime contracts to large companies within the limits of our experience, has tended to help, rather than limit the small-business phase of our defense dollars.

Perhaps typical of overall figures is the designer and manufacturer of our Bullpup missile. In 1956, he subcontracted 32 percent of his 9 million Bureau of Aeronautics dollars, and 34 percent of them went to small business; in 1957, 37 percent was subcontracted with 39 percent to small business; and in 1958, of 29 percent subcontracted, small business got 56 percent. These results are attributable in large measure to the aggressive attitude of this contractor toward the small-business program. He provides constant assistance, arranges demonstrations to illustrate those of his requirements that small business can satisfy, and, all his subcontracts at first-tier level require compliance with the tenets of our Navy small-business program at the second-tier level.

This concludes my remarks. I have tried to draw for you a straightforward picture of the problem as we see it and what, with our best efforts to date, we are able to do about it. I shall welcome any suggestions that will help and, of course, I shall be glad to try to answer, with the help of my staff, any questions you may have.

I have with me for the purpose Capt. H. O. Hauck, Director, Guided Missiles Division, Commander Good, Comdr. Frank N.

Colenda, Production Division, and Mr. James S. Tassin, Assistant Director, Contracts Division.

Thank you.

Senator SMATHERS. Senator Sparkman, do you have any questions?

Senator SPARKMAN. I have no questions, Mr. Chairman.

Senator SMATHERS. Senator Thye.

Senator THYE. No questions. It is a good report and most encouraging.

Senator SMATHERS. My only question is when you look at Admiral Stroop's statement—and not wishing to get the Navy divided on any issues—but listening to his statement in comparison with yours, it appears that they find that they are able to give some of these larger contracts, direct more business of a prime nature to small business and you people don't think that any of it should be?

Admiral DIXON. That is right.

Senator SMATHERS. How do you account for the fact that there is this difference in the results?

Admiral DIXON. I think Admiral Stroop pointed it up, Mr. Chairman. It is the difference in the organization of the two bureaus and the mission of the bureaus. The Bureau of Ordnance, as he stated, has been in the ammunition, the weapon and shell field, and so forth, in which there was limited capability commercially, or rather in the civilian communities. They have had to establish laboratories, and so forth, whereas the Bureau of Aeronautics has been in the aircraft business since its inception and we have derived our capabilities in this field largely from commercial sources. We have felt it unwise to attempt to duplicate the large aircraft—the capabilities of the large aircraft companies and as we move into the missile field we naturally utilize our procedures that we used for aircraft production in the missile productions.

Mr. WEADOCK. Admiral, if they are better equipped to handle this problem, why doesn't Mr. Bantz give BuOrd the responsibility for your missiles since you feel they are historically better prepared to satisfy this missile requirement because of their ordnance background? Why not assign to the Bureau of Ordnance the Bureau of Aeronautics' responsibilities in the missile field?

Admiral DIXON. Mr. Weadock, I don't think I made any such statement. I did not make a statement I thought their system was better. I merely tried to draw a comparison between the two.

Mr. WEADOCK. I'm sorry, I thought you said they had been in the field longer and would be better equipped to handle it.

Admiral DIXON. No; they have been in the specialized field of ammunition and weapons, you might say development; whereas we have been in the airplane and aeronautics business.

Mr. WEADOCK. Regulus is perhaps your largest missile, is it not, Admiral, from the standpoint of expenditure of dollars?

Admiral DIXON. Yes.

Mr. WEADOCK. There is nothing in your statement in relation to the Regulus picture percentagewise or otherwise. I wonder if you could furnish us complete information on that? [4]

Admiral DIXON. We will be happy to do so.

Mr. WEADOCK. You have primarily touched on the subcontracting aspect, which we seem to gather indicates your position in this matter,

[4] See letter dated May 12, 1958, from Admiral Dixon, exhibit 13, p. 141.

that here is the most fruitful field for small business. Only one paragraph, on page 4, I believe it was, do you indicate what you are doing internally in the Bureau. In other words, what you are doing about that which you can actively control. I think it would be helpful if Admiral Stroop indicated to us several matters that his Bureau was initiating, and I think perhaps if we could make the suggestion, that perhaps Commander Good and Mr. Lenahan get together. It seems to be working productively in the Bureau of Ordnance and if you want to explore the possible avenue they travel and perhaps interchange ideas, I think it will be helpful.

Admiral DIXON. I certainly concur and I will see that these steps are taken. I would like to point out we have currently the most close cooperation in the small-business field, but I will certainly do this.

Mr. WEADOCK. Yes; you have had those set-asides.

Admiral DIXON. I cannot identify them from the missile field.

Mr. WEADOCK. You can't break it out?

Admiral DIXON. No.

Mr. WEADOCK. In the Bureau, what has been your percent of prime contract awards to small business in the missile and related equipment field?

Admiral DIXON. You mean from the Bureau of Aeronautics dollar or the subcontracting dollar?

Mr. WEADOCK. No, sir. From the Bureau direct in prime contracts to small business in the missile and related equipment area.

Admiral DIXON. Well, I would like to point out, sir, on this, that when we talk about the Bureau of Aeronautics dollar we refer to airplane contracts, missile prime contracts, and engine contracts. We buy the big items. Our percentage from July until February of this year was 1 percent of the total Bureau of Aeronautics' dollars. This amounted to $12,200,000.

Mr. WEADOCK. That was the total BuAer air dollars?

Admiral DIXON. No; not procurement. This is procurement originated within the Bureau; not let out for other activities to purchase for us.

Mr. WEADOCK. Yes, sir. Now that incorporates not only the missile program but also your aircraft program?

Admiral DIXON. Correct.

Mr. WEADOCK. Is it possible for you to distinguish between the two? In other words, could you break out your figures for missiles only?

Admiral DIXON. We would have to break them out detailedly for you in the record. (See letter from Admiral Dixon, p. 141.)

Mr. WEADOCK. All right, sir. It strikes us, well, we begin to wonder who is carrying the load here. Secretary Bantz tells us it is about 3 percent overall. Admiral Raborn tells us that he is down to 1 percent. It may be that you are even below that. Is this difference all on Admiral Stroop over here, Mr. Secretary?

Mr. BANTZ. I think on that, sir, that particularly the Sidewinder, one of the simplest missiles in all the production and very early production accounts for part of that. I would want it broken down before I made a statement like that, but I think the Sidewinder is a missile that would lend itself to this much more so that the much more complicated missiles.[5]

[5] Subsequently determined that the 3 percent reported by Mr. Bantz covered the last 5½ years, while the percentages reported by Admiral Raborn and Admiral Dixon covered the last 2½ years.

Senator SMATHERS. Mr. Stults.

Mr. STULTS. One question, Admiral. On page 4 of your statement you say—

as the [missile] progresses to the hardware stage, more subcontracting is in order and we move in to encourage the prime contractor to engage the services of small business.

On page 5 you take the Bullpup and in 1956 there were 32 percent subcontracted; 1957, 37 percent; and 1958, 29 percent. You have got to a point apparently where it has done up to the top and has fallen down on the other side.

Admiral DIXON. I would like to point out that our 1958 record is incomplete. It is only a half a year and I think we should talk to 1956 and 1957 on that.

Mr. STULTS. So, I would assume that Bullpup is in more of a hardware stage in 1958, whether it is 8 or 12 months, than it was back in 1956.

Admiral DIXON. Very definitely. I think this percentage will show a higher figure at the end of 1958 for 1958.

Mr. STULTS. Fine. Thank you.

(The information subsequently supplied by Admiral Dixon follows:)

EXHIBIT 13

DEPARTMENT OF THE NAVY,
BUREAU OF AERONAUTICS,
Washington, D. C., May 12, 1958.

HON. GEORGE A. SMATHERS,
Chairman, Select Subcommittee on Government Procurement,
Senate Select Committee on Small Business,
Washington, D. C.

MY DEAR MR. CHAIRMAN: In the course of the hearings of the Senate Select Committee on Small Business on May 1, 1958, it was agreed that additional information should be furnished to you at a later date. The questions, and the answers insofar as they are available, are as follows:

Question 1. In the set-aside figure of $15 million for Bureau of Aeronautics prime contracts, how much was set aside for missile contracts?

Answer. This is an overall figure covering all procurement and the identification of set-asides in one particular area would be extremely difficult. For the reasons advanced during the hearings it is unlikely that any significant amount of prime moneys were set aside on missile programs.

Question 2. Requested that subcontract figures on Chance-Vought (for Regulus II) be submitted for the record.

Answer. Reports from the prime contractor indicate that small business has received approximately $19 million during the past 2½ years. This represents 19 percent of moneys awarded the contractor by the Bureau for the development and production of the Regulus missile. On an annual basis the percentages were 16.4 percent for 1956, 17.5 percent for 1957, and 23 percent for the first 6 months of fiscal year 1958. The contractor is hopeful that this trend will continue.

Question 3. Of the dollar value of all prime contracts processed by the Bureau of Aeronautics approximately 1 percent is awarded to small business. What portion of this 1 percent is derived from missile contracts?

Answer. As far as can be determined small business did not receive any prime contracts in the A–2 (guided missile) program during the period from July 1957 to February 1958. While the potential of small business for prime contracts in the missile field is limited, it should be emphasized that all such procurements are screened for possible small-business participation.

Sincerely,

R. E. DIXON,
Rear Admiral, United States Navy,
Chief of the Bureau of Aeronautics.

Senator SMATHERS. All right, I think that concludes the Navy side of it and I must say it has been a very fine presentation.

I want to make one comment. You know, for many years, Mr. Secretary and Admiral Clexton, we have had this fellow Neal Curtain, who was assigned by you people to help us and to work with small business. He did such a wonderful job that when he left, we were greatly in fear that it would be extremely difficult to fill his very ample shoes, but our staff tells me that your new man, Capt. Fred Allis is doing a very wonderful job so we want to commend you for having him on the job and for the job he is doing. Thank you all, very much.

The Army will get ready to take over.

Senator SPARKMAN. Gentlemen, we will be very glad to have you with us. Senator Smathers had to leave briefly. He is chairman of this subcommittee. I shall take over until he gets back. Our first witness for the Army is Hon. Frank H. Higgins, Assistant Secretary of the Army. We are very glad to have you with us. If you have your statement, you just proceed in your own way.

STATEMENT OF HON. FRANK H. HIGGINS, ASSISTANT SECRETARY OF THE ARMY (LOGISTICS)

Mr. HIGGINS. Thank you very kindly, Mr. Chairman.

First, I would like to introduce my principal witnesses who are with me here today. We have Maj. Gen. John H. Hinrichs, who is Chief of Ordnance of the United States Army; Brig. Gen. John G. Shinkle, who is Deputy Commander of the Ordnance Command at Huntsville, Ala., on my left; and Gen. E. C. Itschner, Chief of Engineers; and Maj. Gen. James Dreyfus, Acting Chief Signal Officer, and here today representing the Signal Corps.

If time permits, and it pleases the committee, we have a film here which would show the firing of our principal missiles. Also, if time permits, I have the top civilian representatives of the Chicago Ordnance District who, in the last few months, has worked out a new, very unique approach, I think, working through the chambers of commerce in distressed labor areas for small business where we have been able to shortcut the preparatory work, let's say, to a man gleaning the information as how he may seek the contract with the Government. We have that also to present.

Now, Mr. Chairman, my statement is short but the statements we have here of these officers, some of them are rather lengthy. We have a statement here from General Medaris,[6] a rather lengthy statement, along with a shorter statement from General Shinkle. General Shinkle is here to comment on both of them. General Hinrichs, our Chief of Ordnance, also has a lengthy statement and if it pleases the committee, we will simply highlight these statements and offer them for the record.

Senator SPARKMAN. That will be quite satisfactory. The full statements will be printed in the record and then you can summarize or highlight them as you see fit.

Mr. HIGGINS. Yes, sir.

Now, we feel there is considerable information in all these statements that will be beneficial to the committee and, I hope, show the

[6] General Medaris did not attend the hearing but submitted a statement which was presented by General Shinkle.

progress that we have made since our appearance before this group a year ago. The highlights of my statement would be, gentlemen, that we have addressed ourselves this year according to our guidelines, primarily to our missile family. I see they have them displayed on the right and left of the platform here. Some of these are brand new, therefore, still in the development stage. Some of them have leveled out into the production stage. I am referring particularly to the Nike and I am addressing my remarks chiefly to the Nike because I feel there we have an opportunity to better work out contractual arrangements on something that is in a production status. My report would bring forth our preliminary and primary planning on the Nike.

First, our plant at Charlotte, N. C. where the Nike missile is assembled, before we approved any tools whatsoever for the prime contractor, we caused him to make a survey of that particular area whereby the work that could be performed by normal industry, and not attempt to secure tools from the Government to do that kind of work in the plant. This was done. I personally went to Charlotte and had a meeting with the chamber of commerce down there and announced the program to the community. As a result, only machine tools were furnished by the Government for those operations which they could not secure in the community or in the Nation as far as that is concerned. Like position has been taken with the guidance equipment and this committee heard earlier in the week from Mr. Fred Lack, the executive vice president of Western Electric, how this was worked out. I turn to the record and would say that it speaks for itself.

I have referred particularly to this operation because it is one that will be indicative of what we are able to do once we get these missiles in production. However, there are the missiles-systems concept, that will be touched on by my colleagues, which embraces the research and the development process, the pilot-line production where what we call "debugging the operation" takes place, and when drawings and specifications are tightened up. That having been done, we then reach the area of break out whereby we procure direct the maximum amount of the work to be performed.

So, if it pleases the committee, that highlights my remarks and I would like that you hear from my colleagues across the board before the questions are presented, if you please, because we feel we will bring you a complete picture.

(The full prepared statement of Hon. Frank H. Higgins reads as follows:)

STATEMENT OF HON. FRANK H. HIGGINS, ASSISTANT SECRETARY OF THE ARMY (LOGISTICS)

Mr. Chairman and members of the committee, I am Frank H. Higgins, Assistant Secretary of the Army (Logistics). We are pleased to appear here today to present information about the Army's missile systems, and the role of the small-business concern. As you are well aware, a missile system is vastly different from conventional weapons, both in its composition and in its production. The system may consist of ground installations, ground support equipment, electrical, hydraulic, mechanical, and electronic components, and the intricate missile itself. These systems have been developed under conditions of urgency. Stabilizing designs and breaking out components for direct purchase has been difficult due to rapid technological progress. The development and production of these systems requires vast resources in scientific and technical manpower, laboratory

and testing facilities, production space, and capital investment. In one missile facility recently completed the prime contractor invested more than $18 million, with 500,000 feet of floor space in 5 buildings, and with a total employment of about 3,000 people, of which approximately 1,400 are engineers, scientists, or skilled technicians. To obtain this capability, we have been forced to turn to that segment of industry possessing such competence. Our first objective always has been the development of the finest defense system, and this has required that we seek out the best skills and know-how of the Nation.

As we have progressed, however, we have used the great reserve of experience and production ability of the small-business community. We have tried to avoid the concentration in our large prime contractors of that which could be done by subcontracting. For example, when we established the new Nike facility at Charlotte, N. C., we put into the plant only the production facilities necessary to produce components which could not be readily obtained by subcontracting. In 1956, when I dedicated this plant, I told that community of this decision. The resulting program of subcontracting is of benefit not only to small concerns in that State, but over the Nation. The subcontracting program of that prime contractor, represented by Mr. Fred Lack who has just appeared before you, speaks for itself.

We try to break out from the prime contractor components for separate competitive purchase and, similarly, we try to obtain early complete drawings and specifications. We identify proprietary items and try to design comparable substitutes. Small businesses have made valuable contributions in some areas as prime contractors. They have participated substantially in Nike site construction, and are a valuable source for research and supply in support of our efforts at the Army Ballistic Missile Agency.

We believe, however, that the conclusion is inescapable that the smaller business concerns make their most valuable contribution to these programs as suppliers to the principal prime contractors, concentrating on those areas in which they are most skilled. We have tried to assist small business by requiring prime contractors, by specific contract provisions, to subcontract to small business to the maximum. We have published the names and addresses of our large contractors, to assist small concerns in establishing contact with them. This information is available in our purchasing offices. Practically all of the Army's major missile contractors have designated their own small business liaison officers. In 1957, 60 prime contractors reported to us subcontracts totaling $190,756,800 to small business. The Army itself employs 216 small-business specialists and maintains 33 small-business display rooms throughout the country. These physical displays make it possible for interested firms to see and study items currently being purchased.

Even as missile programs increased, last year 37 cents out of every Army dollar was awarded to small-business prime contractors. Since we buy many of the common-type items for all three military services, such as subsistence and clothing, our awards to small business are understandably higher than those of Navy and Air Force.

With our aggressive program to bring the small concern into contact with the larger prime contractors, and as our designs become stabilized and components are broken out, we believe that small business will make an increasing contribution to the missile program. I do not believe that the changing pattern of our weapons systems will rob this Nation of the wealth of skill and experience which small business firms have always given us.

Mr. HIGGINS. I would like next to call on General Hinrichs for the reason that General Hinrichs has recently been appointed the Chief of Ordnance. The American Ordnance Association is entertaining General Hinrichs at a luncheon in the ballroom of the Mayflower Hotel today and he is the guest of honor there. May we hear from him?

Senator SPARKMAN. Very good, General Hinrichs, we will hear from you now.

STATEMENT OF MAJ. GEN. J. H. HINRICHS, CHIEF OF ORDNANCE, DEPARTMENT OF THE ARMY

General HINRICHS. Mr. Chairman, I am very happy to appear before you. I plan to ask you to enter my written statement in the record and I will amplify that a little bit. I would like to emphasize that the things that I am going to talk about are examples of what we in Army Ordnance are doing in the small-business area.

First, I might say that individually I am quite conscious of small business. This has come about largely, I must admit, through vicarious experience; my family has had some interest in small business and knows a little bit about that angle.

Second, I would like to emphasize that my most able predecessor, General Cummings, who testified before the committee last year, directed initially most of the efforts which we are now talking about. I want to be sure that it is understood that I am not claiming this for myself, but I am very much interested in continuing the things which he started and possibly adding some others. We have a very able and a rather extensive organization of small-business specialists in the field. My own small-business specialist here in Washington is Mr. Evans. I think he is known at least to the staff of your committee.

Now, I would like to at this point state what actions we have taken in our Ordnance districts; Mr. Higgins has mentioned one of them. We have developed from those districts some very good ideas in this area. The first one I will mention is that which is going on in the St. Louis Ordnance District where they have developed what they call an integrated missile approach—a team approach to this problem. They have gone to the chambers of commerce in the surrounding areas, and have interested firms in this effort. They have assisted them in pooling their efforts, so that where one huge company might take a contract, many small companies can get together and by joint effort get into this missile business and do some production.

At the current writing I am informed that we have six very active groups of this nature that are either in or about to get into the missile business. This is of fairly recent origin but it seems to be bearing fruit. (See exhibit 15 (a), p. 152).

Secondly, I would like to mention that Tuesday and Wednesday, yesterday and the day before, this week, at the Detroit Arsenal under General Lynde, who manages the Ordnance Tank Automotive Command, we had a symposium which was attended by about 550 people representing 150 firms, most of which were in the small-business category. They were given information as to what the Army's needs were and what they would be over the next 10 years, or the near future. I think that this effort is very definitely in the direction of promoting the employment of small-business concerns to the end that we not only get the benefit of their knowledge, their ability to produce, but also spread the collection of ideas.

The third thing I would like to bring to your attention—Mr. Higgins has also mentioned—that is that I am going to give a talk to the American Ordnance Association in a half hour or so. The theme of my talk is small business and how to get them into the research and development field. With the cooperation of the American Ordnance Association, we are going to distribute, at that meeting, copies of the definitive orders which we have put out quite recently (the 9th

of April). Information will be provided as to how a small-business concern can qualify; how it can get security clearances; and how it can enter into the picture, technically, in the development field in getting business from Army Ordnance.

If you would like for the record, I will be very happy to furnish a copy of the Ordnance Corps order which specifies the direction which we carry on in the field to bring in these small firms. I feel a little immodest about this, but you may also have a copy of a speech I am going to make at noon, if you so desire.

Senator SPARKMAN. We will be very glad to have both, General. We only wish we could hear you make the speech.

General HINRICHS. Well, I think you are very lucky, sir. That concludes my remarks. If there are any questions, I would be happy to answer them.

Mr. HIGGINS. You might indicate that you have backup people here.

General HINRICHS. Yes. I might introduce General Shinkle and Colonel Frank, both of whom are particularly versed in the missile field, particularly in regard to small business and business in general.

Senator SPARKMAN. Thank you, General Hinrichs. Feel free to leave any time you wish.

General HINRICHS. Thank you very much. If I may, I will leave now. I have only a few minutes.

(The documents submitted by General Hinrichs follow:)

EXHIBIT 14

DEPARTMENT OF THE ARMY

OFFICE OF THE CHIEF OF ORDNANCE

Washington, D. C.

APRIL 9, 1958.

ORDNANCE CORPS ORDER No. 7–58

RELEASE OF QUALITATIVE DEVELOPMENT REQUIREMENTS INFORMATION

1. Background

Civilian organizations are demonstrating an increasing amount of interest in and concern for the solution of national-defense problems. Many ideas for new weapons and materiel items are thus being generated voluntarily and presented to the Army for consideration. The Ordnance Corps welcomes this interest and wants to encourage the generation of new ideas from all sources. However, there are rather frequent cases where costly voluntary efforts of this kind end in disappointment because the idea is not sufficiently compatible with all the factors which must be considered by the Army. It is, therefore, desirable to establish a mechanism which will enable properly qualified and interested civilian organizations to become better informed regarding the Army's requirements for new materiel items, in order that they may most effectively conduct their voluntary developmental efforts.

2. Purpose

This order prescribes policy and procedure for the release of information regarding the qualitative requirements for development of new ordnance materiel to qualified civilian organizations prior to the time when specific contracts may be under consideration.

3. Scope

This order is applicable to all ordnance class II installations and activities assigned a research or development mission and to the ordnance districts.

4. Definitions

(*a*) *Qualitative development requirements information.*—Information regarding current and future ordnance requirements for development of new items, components, materials, or techniques which effect earliest feasible exploitation of new knowledge; this information may include military characteristics, technical characteristics, other technical details, and related background or state-of-the-art data.

(*b*) *Qualified organization.*—Any United States individual, firm, partnership, corporation, or other type of civilian organization which has—

(1) expressed a desire to participate in the research and development effort of the Ordnance Corps;

(2) obtained the required individual and facility security clearances;

(3) presented acceptable evidence of a research and development capability in being, and, in cases where the organization's area of interest exceeds their capability in being, acceptable evidence of a firm and feasible intent to adequately expand the capability;

(4) furnished the required signed copy of a policy agreement for release of qualitative development requirements information.

5. General

It is in the national interest that ordnance effect maximum feasible utilization of civilian research and development capability. This requires that qualified civilian organizations be able to learn what new ordnance items the Army desires to have developed, far in advance of the time when specific related contracts may be under consideration, so that they can determine how they might most effectively seek to participate in the Ordnance research and development activity. Therefore, every qualified organization has a proper need to know for qualitative development requirements information, within the limits of its area of interest and research and development capability, as evaluated by Ordnance.

6. Information to be released

Information released in accordance with this order will be limited to the types outlined in paragraph 4a. Information released will not include any monetary or quantitative procurement information or any other information which would constitute the release of advance procurement information. (See par. 4, AR 600–205.)

7. Methods of release

Qualitative development requirements information may be furnished to qualified organizations through interviews, briefings, distribution of written documents, or by correspondence. It is considered that many subject areas may be adequately presented, to those qualified organizations which possess the required capability, through briefings held at suitable intervals.

8. Policy agreement

The release of qualitative development requirements information to a civilian organization, under the provisions of this order, does not obligate the Government in any way. To assure knowledge of this and other pertinent conditions, prior to the release of such information in writing, the organization to which the information is transmitted must previously have made available to the installation or activity furnishing the information a properly signed and dated copy of a policy agreement for release of qualitative development requirements information. (See OCTI 200–2–58.)

9. Responsibilities

(*a*) The Assistant Chief of Ordnance, Research and Development, is assigned responsibility and delegated authority to prescribe any additional criteria and instructions necessary to implement this order.

(*b*) The ordnance districts will serve as initial points of contact for civilian organizations which desire to receive qualitative development requirements information, and perform those services specified in OCTI 200–2–58.

(*c*) Commanders of all ordnance class II installations and activities assigned a research or development mission are assigned responsibility and delegated authority to furnish qualitative development requirements information to qualified organizations in accordance with the provisions of this order and OCTI 200–2–58.

10. Exceptions

Exceptions to the policy and general provisions of this order will be allowed only upon written approval of the Assistant Chief of Ordnance, Research and Development.

J. H. HINRICHS,
Major General, United States Army,
Chief of Ordnance.

OFFICIAL:
R. E. PETERS,
Colonel, Ordnance Corps,
Executive Officer.

[SEAL]

Distribution: A.

(General Hinrichs' speech before the Washington Post of the American Ordnance Association follows:)

EXHIBIT 15

REMARKS BY MAJ. GEN. J. H. HINRICHS, CHIEF OF ORDNANCE, BEFORE THE WASHINGTON POST OF THE AMERICAN ORDNANCE ASSOCIATION, MAYFLOWER HOTEL, WASHINGTON, D. C., MAY 1, 1958

Mr. President, Mr. Toastmaster, ladies and gentlemen:

In the beginning there was Adam.

Then came Eve.

Then came research and development.

Then came all hell to pay.

From such a simple and unadorned beginning we have progressed to the point where research and development are a good deal more than casual curiosity and easy experimentation. They are now business, and big business, to both "big" and "little" business. This is clearly demonstrated here today by the broad representation of all types and sizes of industry and science in this splendid audience.

I am particularly pleased that your group includes such a wide dispersion of capable people and enterprises, for this talk was sparked by the initiative and the imagination of many individuals and organizations, scientific and industrial, who have voluntarily worked up and presented new ideas for better Army weapons.

I have deliberately used the word "voluntary" to indicate that what I am talking about is the R. and D. effort which is expended without benefit of any contract to cover the cost of the effort. We in Ordnance welcome this interest and initiative regarding our national defense problems and always want to encourage the generation of new ideas, regardless of the source. (Parenthetically, I might add that sometimes we do pay for them.) But ideas generated on this voluntary basis have speeded the development of better Ordnance materiel and also benefited those groups which spawned the successful ideas. Both of these results benefit the country.

Now ideas are usually uncomfortable things to try to handle. In the first place they are hard to come by. In the second place, even though hard to come by, there are so many of them. Thirdly, they are hard to deal with whether you are trying to sell them or to buy them. Sometimes they are "bread cast upon the waters" and sometimes they are more like a cast spread upon the alders—they wind in everything in the area except the fish.

Those three points lay out the parameters of our problem—and I use the word "our" advisedly, meaning "yours and mine." How can we best handle this problem?

In the first place, let us never discourage the man with an idea. It may be not too useful today, but it may be pay dirt tomorrow. If it is really a new idea, let us nurture it. (Incidentally, I am talking to my own people in Ordnance as well as our teammates in science and industry.) If it's a new and good idea, bring it gently but firmly to net and let us get about cooking it right. If it is an old idea, gently release it, because who knows? It may spawn a batch of beauties next spring.

As to the second point, that there are so many of them, I would urge you to consider several things:

A certain degree of patience is required. This degree of patience might be termed that of "frantic calm." We do have, in Ordnance a sense of urgency,

and I can assure you that we realize that time is our scarcest commodity—not dollars, or scientists, or engineers. But we all know that there must be some time involved in acting on the mass of ideas that we develop in Ordnance, and the many more by the science and industry members of our team.

I believe it is appropriate to state that I am proud of the record of Army Ordnance in the production of ideas, and their translation into hardware. Some of these ideas have been in the field of weaponry, some in the arts of working metal, some in other arts and disciplines. Some of these ideas have been purely military in application, some quite universal and of real benefit to science and industry and the national economy. And I hold that the Nation cannot afford to overlook or undercut the truly priceless contributions that our arsenals and Ordnance laboratories are making not alone to our national defense, but to our progress as a nation in the pursuits of peace. (I want to add that our colleagues in the Navy and the Air Force are not—shall I say?—far behind us.)

Now I have, as Chief of Ordnance, certain responsibilities to the Secretary of the Army, to the Chief of Staff, to the American soldier, and to the American people. I have these responsibilities by statute and by regulation. But more importantly, I have them as moral responsibilities. The Ordnance Corps shares these responsibilities with me, but cannot relieve me of them. They are: to insure that we get the best; that we furnish and maintain the best; and that we do those things in the most effective way possible, and at the most reasonable cost in the light of those criteria. Did I not have available the scientific and technical know-how within the Ordnance Corps, neither I nor the corps could fulfill those responsibilities. That know-how lies in our arsenals and labs, our districts, and our depots. This is important to you as citizens, as well as scientists and industrialists, since if we in Ordnance cannot say "yes" or "no" with some certainty on a given idea, we all suffer—on the balance sheet, true; but more importantly, on the battlefield in blood.

So we in Ordnance must deal as rapidly and effectively as possible to insure that of the multitude of ideas presented, we—you and I—work on the most promising.

And now my third point: How deal with them?

We don't want to disappoint you, nor do we want to see you pour hard-earned dollars down the drain. So, stated most simply, I am saying: Let's have ideas, but let's check them out. Let's go for the engineering evaluation and then let's screen them against all we in Ordnance know and can foresee of the military art and its requirements. We can and will help you in this by furnishing prenatal, delivery, and postnatal care and advice on your idea.

Our job—and it may turn out to be the trick of the week—is to make this information available to the organizations that can use it when they need it. We want to give it to those qualified organizations who have never had an Ordnance R. and D. contract, as well as to establish R. and D. contractors. Much of the information concerned is classified "Secret," so we recently established some new procedures to increase both the availability and flow of this information. These procedures will enable any properly qualified civilian organization to learn what new things the Army would like to have developed, or whether an idea already being worked on by the organization considers the factors which affect possible Army use of the idea.

In case you would like to be able to refer to it, the order which I am talking about is known as Ordnance Corps Order 7–58, dated April 9, 1958. It covers the release of information regarding current and future Ordnance requirements for development of new items, components, materials, or techniques, and includes military or technical characteristics and related background or state-of-the-art information.

It defines as "qualified" any United States organization which has expressed an interest, produced evidence of a suitable R. and D. capability, demonstrated a "need-to-know," obtained the necessary security clearances, and signed a required policy agreement form.

It must be understood that the release of development requirements information under the provisions of this order does not obligate the Government in any way. A statement to this effect is therefore one of the principal parts of the policy agreement form.

The general procedures work like this. If your organization is already working with Ordnance on an R. and D. type contract, go direct to the Ordnance Ammunition Command, the Ordnance Weapons Command, OTAC, or the Ordnance Missile Command, or the arsenal with whom you are dealing for additional information on development requirements. They know you and your R. and D. capability. If you are not presently under an Ordnance contract, go to the nearest Ordnance District. The Ordnance District will tell you how to get

qualified. When the District finds that you are qualified, it will steer you to the proper commodity command or arsenal. Development requirements information will normally be released only from the Ordnance Commodity Commands and commodity arsenals, and by interview, group briefings, documents, or by correspondence. For the time being, at least, group briefings will be the principal method of meeting the demands for this kind of information. We have already conducted two identical briefings of this type, one at the Pentagon and one at Springfield Armory, relating to development requirements in the small arms area. Similarly, on Tuesday and Wednesday, this week, 550 representatives of 150 industries interested in research and development of tanks and automotive equipment were briefed on the materials, components, and vehicles required by the Army of the future, in the OTAC auditorium at Detroit Arsenal. OTAC was assisted by representatives of Watervliet, Picatinny, and Frankford Arsenals and the Ordnance Missile Command. The purpose was to give management and development engineers a coordinated picture of, and an understanding of the research requirements of the Army during the next decade, for tanks, combat vehicles, and other automotive equipment.

Once your organization receives development requirements information, we propose, insofar as practicable, to keep you informed regarding significant changes in that information. We will keep this up as long as your organization continues to demonstrate an active interest. If a year passes without our hearing from you on that subject, we will ask that you either indicate a continuing interest or return the written information which was furnished.

These new procedures are in effect now. Although we can never guarantee new or increased business for any organization, we do invite you to try out these new procedures—if you have a new and good idea.

We in Ordnance realize the magnitude of the job we're biting off when we offer to advise you of the state-of-the-art and even what military needs may be. We know fairly well what is desired right now, but when we're soliciting ideas for things to be used 10 or more years in the future, it's an entirely different matter.

Heroes are made when a man with a vision as to how to solve an anticipated problem meets a man with the authority and money to carry it out, and the solution is successful just at the time the problem becomes acute and very real.

On the other hand, if the solution is late and costly, or the anticipated problem fails to materialize, the men involved are a bunch of incompetent wasters.

I venture to say that neither science, nor industry, nor ordnance is perfect. I know you realize this. So when you are presenting new ideas, remember that we in Ordnance are in a state of "frantic calm" and make allowances for the situation. Past experience has taught me that when you are really convinced that you have a good idea, you're not easily discouraged. So together, we should insure a proper hearing. We in Ordnance will do our best to back the ideas that appear to offer the greatest potential benefit to our national defense.

In closing, I want to state that in addition to those responsibilities I mentioned earlier, that I feel a definite responsibility to American science and industry. I intend to fulfill that responsibility. I am sure you feel a responsibility to Ordnance. The American Ordnance Association is the catalyst that transforms those responsibilities into the sword and shield that mean national freedom through strength.

(The full prepared statement of Maj. Gen. J. H. Hinrichs reads as follows:)

PREPARED STATEMENT OF MAJ. GEN. J. H. HINRICHS, UNITED STATES ARMY, CHIEF OF ARMY ORDNANCE

Mr. Chairman and members of your Subcommittee on Government Procurement, I appreciate this opportunity to report to you on the responsibilities and authorities assigned to the United States Army Ordnance Corps in respect to United States Army missile programs.

Initially, I would like to reemphasize the important role of small-business concerns throughout the United States in the accomplishment of the United States Army Ordnance Corps missile program. Simply put, this program covers the expeditious execution of the Army missile program so as to realize the earliest possible operational deployment for the missiles. We recognize the important contributions of small business in the fields of both science and industry, and know that we must help and maintain the resources of know-how and production that are available in this important segment of the American economy. In securing the maximum participation of small business in our research, develop-

ment, and production programs, I am satisfied that we have within the Ordnance Corps a basically sound small-business structure, and believe that the small-business specialists in our employ are qualified people, and are properly placed throughout the corps. My office here in Washington establishes policy and exercises staff supervision over the overall ordnance small-business program. Mr. H. Mansell Evans is my small-business adviser, and has staff jurisdiction over the 75 small-business specialists throughout the corps.

The United States Army Ordnance Corps is a decentralized organization. We separate our commodities and assign them to appropriate commands and arsenals who are charged with the responsibility for the planning, direction, controlling, and accomplishment of their particular programs. These commodity commands procure, on a nationwide basis, by formal advertising. They also direct, control, and approve negotiated procurement, within delegated authorities, with actual negotiations being conducted principally by the Army Ordnance district offices that represent the 14 geographical areas into which the country is divided. These district offices, in addition to awarding contracts, are also charged with the responsibility for administering the contracts which have been awarded as a result of formal advertising conducted by the commodity commands.

At each of these commodity command installations, there is a full-time small-business specialist functioning as an adviser to the commanding general or officer, to whom he has direct access. These specialists, as active members of the Purchase Assignment Board, initially screen the proposed procurement for suitability of small-business participation and the method of procurement to be used. They also make recommendations to the contracting officer as to the desirability of utilizing a total or partial small-business "set-aside." On procurement of $10,000 or over, these specialists further screen the proposed procurement with the Small Business Administration representative and jointly recommend to the contracting officer the desirability of a joint small-business "set-aside."

Likewise, each of our 14 Ordnance district offices has a small-business specialist functioning as an adviser to the district commander. Again, they are organizationally placed so that they have direct access to the district commander. The specialist at the district office has many important responsibilities relative to small businesses. Among other things, he must see that they are adequately represented in the bidder's lists for solicitation, and that they receive all available assistance in financial and technical areas. A small-business specialist assists them, when needed, in the preparation of bids and proposals. Acting in behalf of the contracting officer, he contacts both small and large business to urge maximum utilization of small business in subcontracting roles.

In your letter of March 28, 1958, to the Secretary of Defense, you have expressed a desire to explore the field of guided missiles, rocketry, and outer-space exploration. You further expressed your concern in the share of contract dollars being awarded to small business in these fields of endeavor. To provide you with a complete picture of the United States Army Ordnance Corps' operations in the area of missiles and rocketry, we have with us today Brig. Gen. J. G. Shinkle, commanding general of the Army Rocket and Guided Missile Agency. General Shinkle and his staff will later present to you details with respect to their operations. However, prior to General Shinkle's presentation, I would like to make a very brief statement concerning the assignment of responsibilities within my organization in respect to United States Army missile programs.

By Department of the Army General Order No. 68, December 22, 1955, there was established and placed at Redstone Arsenal, Ala., effective February 1, 1956, the Army Ballistic Missile Agency, as a class II activity under the jurisdiction of the Chief of Ordnance. Maj Gen. John B. Medaris was named commanding general of this new Agency. Effective March 31, 1958, the United States Army Ordnance Missile Command was established at Redstone Arsenal, Ala. Maj. Gen. John B. Medaris was named to command this new Army Ordnance Missile Command. This new command is an integration of all of the Army primary missile research, development, tests, and logistic support installations under single direction, resulting in administrative streamlining, which will provide the means to carry out more effectively existing and future Army missile programs.

The commanding general of the Army Ordnance Missile Command, through the Chief of Ordnance, has the personal responsibility and authority for the execution of all missile projects assigned to the Department of the Army. The entire resources of the Ordnance Corps are at his disposal.

Again I wish to thank the committee for this opportunity to appear before you.

25108—58——11

EXHIBIT 15 (A)

INTEGRATED INDUSTRY MISSILE SYSTEMS TEAM CONCEPT, UNITED STATES ARMY ORDNANCE DISTRICT, ST. LOUIS, MO.

GROUP A

Dresser Industries, Dallas. Tex.	Systems manager, ground support.
Southwestern Industrial Electronics, Inc., Houston, Tex.	Electronics.
Olin Mathieson Chemical Corp., East Alton, Ill.	Propulsion.
Temco, Inc., Dallas, Tex.	Airframe.

GROUP B

Southwest Research Institute, San Antonio, Tex.	Systems manager.
Southwestern Industrial Electronics, Inc., Dallas, Tex.	Electronics.
Chance-Vought, Dallas, Tex.	Airframe.
R. G. LeTourneau, Inc., Longview, Tex.	Ground support.

GROUP C

Nicholson Industries, Coffeyville, Kans.	Systems manager.
Century Electronics, Inc., Tulsa, Okla.	Electronics.
Helio Aircraft Corp., Pittsburg, Kans.	Airframe.
Cardwell Manufacturing Co., Wichita, Kans.	Ground support.
Rocketdyne, Neosho, Mo.	Propulsion.

GROUP D

Midwest Research Institute, Kansas City, Mo.	Systems manager.
Pacific Mercury TV, Joplin, Mo.	Electronics.
Vendo, Inc., Kansas City, Mo.	Airframe.
Butler Manufacturing Co., Kansas City, Mo.	Ground support.
Cardwell Manufacturing Co., Wichita, Kans.	Propulsion.

GROUP E

Wickfield, Inc., Dallas, Tex.	Systems manager, ground support.
Texas Instruments, Dallas, Tex.	Electronics.
Temco, Inc., Dallas, Tex.	Airframe.
Phillips Petroleum Corp., McGregor, Tex.	Propulsion.

GROUP F

Intercontinental Manufacturing Co., Garland, Tex.	Systems manager, airframe, ground support.
Auton Electric Laboratories, Inc., Brooklyn, N. Y.	Electronics.
Phillips Petroleum, McGregor, Tex.	Propulsion.

Mr. HIGGINS. Mr. Chairman, since General Shinkle's presentation will be the longest, I would like to turn now to what we are doing in the Corps of Engineers because this has an interesting association with the missile system. There is a great amount of construction work to be done here which we find to be pretty profitable areas for small business and I would like to ask General Itschner to tell you about the Corps of Engineers and their work.

Senator SPARKMAN. All right, General Itschner.

General ITSCHNER. Good morning, Mr. Chairman.

Senator SPARKMAN. We are glad to have you with us.

STATEMENT OF MAJ. GEN. E. C. ITSCHNER, CHIEF OF ENGINEERS, UNITED STATES ARMY

General ITSCHNER. I am Maj. Gen. E. C. Itschner, Chief of Engineers of the United States Army. If I may, sir, I would like to present my full statement for the record and give you a very brief synopsis.

Senator SPARKMAN. That is quite satisfactory.

General ITSCHNER. The Corps of Engineers' interest in the missile field lies in two areas: (1) provision of certain ground support equipment and (2) construction of missile facilities for the Army and for the Air Force. The former includes both research and development and production procurement operations. Currently we have 38 contracts totaling $72,500,000 in force for this research and development and procurement. Of these, small business has 15 contracts totaling $33,200,000 or 46 percent dollarwise of the total.

For construction, we have currently in force 232 prime contracts in the missile field for the Army and the Air Force of which 209 are with small business. The estimated cost of these contracts is $82,400,000, of which small business has $48,800,000, or 60 percent.

Senator SPARKMAN. Would you repeat that total figure; the first one again. I misunderstood you.

General ITSCHNER. The total figure that I gave you first, sir, was a research development and procurement and that total amount was $72,500,000.

Senator SPARKMAN. And small business?

General ITSCHNER. Small business received $33,200,000 of that total or 46 percent of the dollar value.

Senator SPARKMAN. Thank you.

General ITSCHNER. That completes my statement, sir.

Senator SPARKMAN. Very good.

(The full prepared statement of Maj. Gen. E. C. Itschner reads as follows:)

PREPARED STATEMENT OF MAJ. GEN. E. C. ITSCHNER, CHIEF OF ENGINEERS, UNITED STATES ARMY

Mr. Chairman and members of the committee, I am pleased to have this opportunity to appear before you and discuss the Corps of Engineers' participation in the missile programs of the Department of Defense. The Corps of Engineers furnishes construction services to both Army and the Air Force and also provides certain engineer-type equipment required in the ground support of the Army missile programs. However, the corps is not engaged in the development or procurement of missiles per se. With reference to your March 28, 1958, letter of invitation to the Secretary of Defense listing topics for discussion, only those subparagraphs pertaining to ground support equipment and construction are applicable to Corps of Engineers missile activities. I shall discuss our policies governing contracting procedures applicable to each of these topics along the following lines, as well as certain other general information concerning construction of missile sites which I believe will be of interest to you:

(*a*) Negotiated versus advertised bidding.
(*b*) Factors considered in selecting firms to be solicited for bid.
(*c*) Types of contracts being utilized.
(*d*) Government-furnished equipment versus contractor-furnished equipment.
(*e*) Subcontracting programs.

GROUND-SUPPORT EQUIPMENT FOR MISSILES AND ROCKETS

This area encompasses both production procurement and research and development contracting operations. It is confined principally to mechanical equipment such as special electrical generating sets, air compressors, and equipment for producing, transporting, and storing liquid oxygen, liquid nitrogen, and dry ice.

Negotiated versus advertised bidding

The basic policy of utilizing formal open advertising is habitually followed unless circumstances dictate otherwise. In some instances production contracts for missile support items have been awarded by negotiation because of the urgency of the program and the unusual technological skills required. As examples, urgent requirements for mobile liquid oxygen generating and storing equipment were received when there were no existing standards or commercial counterparts available. In other instances competition has been obtained in negotiated contracts by soliciting proposals from firms which could clearly demonstrate their ability to meet very tight delivery schedules. We are thoroughly aware of the desirability of open advertising and have made considerable progress in eliminating the factors requiring negotiation. For example, a recent award for over $5 million was made to a small-business concern under a small-business set-aside for a precision type of electrical generating set that was originally procured under negotiated procedures.

Selection of firms

The factors considered in selecting firms for bid solicitation are dependent upon the circumstances present in each individual case. When advertising procedures are used, all competent firms who have requested placement on the appropriate bidders lists are solicited. In negotiated procurement, firms which have demonstrated a capability of producing the desired item according to the required delivery schedule are chosen from the bidders list.

Type of contracts

Firm fixed-price contracts are used in advertised procurement. Occasionally, negotiated production contracts contain a price redetermination clause to enhance the prospects of obtaining a fair and reasonable price. Research and development contracts are generally of the cost-plus-a-fixed-fee type, although price redetermination clauses or fixed-price contracts are utilized whenever possible.

Government-furnished equipment

Government-furnished equipment is normally not supplied to prime contractors. The ground-support items procured by the Corps of Engineers for missile systems are generally complete end items and perform a function independently. The item being procured must meet certain specified performance requirements and the provision of component parts by the Government could have an adverse effect on the responsibility of the contractor for the performance of his product.

Subcontracting program

Subcontracting to small business is definitely encouraged. Our prime contractors are urged to establish and conform to the Department of Army subcontracting program to assist small-business firms.

CONSTRUCTION OF MISSILE SITES

The Corps of Engineers is charged with the construction of all Army missile sites and such Air Force missile sites as are assigned to us for construction by the Air Force. Currently, the Air Force Bomarc, ICBM, and IRBM sites have been so assigned.

Negotiated versus advertised bidding

Publicly advertised bidding procedures are habitually employed wherever practicable. Normally, negotiation is resorted to only in cases where time will not permit the delay incident to advertising. Even in the absence of public advertising, competition is realized by inviting proposals from three or more prospective contractors.

Selection of firms

As previously stated in connection with ground support equipment, the factors considered in selecting firms for bid solicitation are dependent upon the circumstances present in each individual case. In public advertising, invitations are sent to any firm requesting an invitation and which qualifies as a competent

construction contractor through a record of satisfactory experience and financial responsibility. When public advertising is not employed, a thorough investigation of all contractors known to be generally qualified is conducted by the contracting officer. Contractors are then selected on the basis of their particular qualifications for meeting the requirements of the job. These requirements normally consist of one or both of the following: (1) Because of the nature of the construction, its satisfactory accomplishment can be assured only by the selection of contractors who have demonstrated their ability in complex and unusually difficult construction to perform high-quality work, and (2) It is necessary to employ an exceptionally competent contractor to assure that the construction will be completed on time. The selected contractors are then invited to submit competitive proposals.

Types of contracts

Construction contracts, whether advertised or negotiated, are lump-sum contracts in virtually all instances.

Government-furnished equipment

In the case of normal construction, contractors are required by the terms of their contracts to furnish all labor, materials, and equipment needed to construct a complete facility. Construction in support of the missile programs must on occasion be accomplished in much shorter periods than those allowed for normal construction operations in order to meet the required beneficial occupancy dates established by the using agency of the Army or the Air Force. To overcome potential delays, long-lead-time materials, such as fabricated structural steel, are purchased by the Government in advance of the award of the construction contract and are furnished to the contractor as Government-furnished material. When special equipment, such as power equipment built to unusual specifications, is required at a large number of sites or installations, it is centrally procured by the Government and furnished to the contractor. This assures uniformity of the equipment which will subsequently be maintained and operated by military personnel and eliminates special tooling or design by several manufacturers. The value of such equipment is actually quite small, however, in comparison with the total construction cost.

Subcontracting program

As in the case of contracts for ground support equipment, prime contractors are encouraged to establish and follow the Department of Army subcontracting program to assist small-business concerns. In the construction trade, prime contractors normally subcontract an average of over 50 percent of the total of their contracts. In building construction, it is not infrequent that 80 percent or more is subcontracted.

GENERAL INFORMATION

Bomarc facilities

Bomarc sites are selected by the Air Force, with the North American Air Defense Command making the actual selections. The Corps of Engineers assists the North American Air Defense Command by providing construction feasibility studies. The site locations are selected to provide, within the effective range of the weapon, overlapping coverage of specified target areas and the perimeter of the continental United States, with preference given to sites located on existing installations.

Normally the construction project comprises such facilities as missile shelters, heating and powerplant, assembly and maintenance buildings, fuel facilities and utility systems. Contracts totaling about $25 million have been awarded at 5 Bomarc locations, which constitute about half of the total construction planned at these locations. There are 11 current contracts ranging in size from $12,000 to $8 million, 6 of which are under $1 million. Of the 11 contracts, small-business firms received 8 awards, totaling $15 million or 60 percent, dollarwise.

ICBM and IRBM facilities

Facilities for the ICBM and IRBM totaling about $27 million of construction work are underway at Cooke Air Force Base, Calif., with approximately $51 million remaining to be contracted for. In addition, about $110 million worth of ICBM construction is planned at Fort Francis E. Warren, Wyo. The facilities at these sites include airfield pavements, dormitories, shops, recreational and administrative facilities, together with the required utilities. Contracts in force number 17, 10 of which are under $1 million. Small-business firms were invited to bid on each of the 17 contracts and received 10 awards totaling $5½ million, or 20 percent of the $27 million under contract.

Nike facilities

Army Nike sites are selected by local antiaircraft commanders and are approved by the commanding general, United States Army Air Defense Command, based on tactical considerations. Personnel of the Corps of Engineers are included in the site selection teams of these commands to advise on the feasibility of construction at the sites being considered. After sites are tentatively selected, real estate planning reports covering land requirements for a defense area are prepared by the Corps of Engineers. Paralleling real estate actions, district engineers of the Corps of Engineers initiate site surveys and subsurface investigations.

Army Nike construction now underway, or to be contracted for during fiscal year 1958, will involve approximately $88,716,000 and can be broken down into four general categories: (1) New Nike-Hercules battalions, (2) conversions of existing Ajax sites to Hercules, (3) improvements to existing facilities, and (4) logistical support facilities.

The new Nike-Hercules construction comprises housing, missile assembly buildings, fueling areas, radar towers, underground missile storage structures, surface launching facilities, powerplants, and utility systems. Five sites are involved with an estimated cost of $6½ million for facilities at each site, or a total of $32½ million. Contract awards are scheduled for the period May through June 1958.

The conversions of existing Ajax sites to Hercules will require new paving in the launching areas to accommodate greater weight and blast pressures of the larger missile and modification to the missile elevators, together with new and increased power equipment. The conversions will be accomplished at 71 sites with an estimated cost of $250,000 at each site, or a total of $17,750,000. Contract awards are scheduled for the period March through June 1958.

Improvements to existing facilities involve a wide variety of work required to reduce maintenance, improve living conditions, and increase the operational effectiveness of the existing Nike sites. Improvements will be made at 243 sites at a total estimated cost of $30 million.

The logistical support facilities, which provide maintenance shops for Ordnance, Signal, and Engineer equipment, will be constructed at 25 sites. The cost at each site will vary from approximately $25,000 to about $1 million, depending upon the size of the facility, with a total estimated cost of $8,466,000.

In order to inform the committee of the construction contract award pattern in the recent past, the North Atlantic division was canvassed as to Nike contract awards for the period July 1, 1957, through March 31, 1958. A total of 40 contracts aggregating $3,695,000 had been awarded during that period and small-business firms had received all contracts.

SUMMARY

In summary, I believe that small-business concerns are receiving excellent consideration by the Corps of Engineers and are actively participating in our programs. This is evidenced by the fact that approximately 60 percent of all contracting dollars spent in the United States by the Corps of Engineers are received by small concerns as prime contractors. I can assure this committee that my small-business specialist and contracting officers will maintain their efforts to insure that small business continues to receive a fair proportion of the total contracts for supplies and services placed by the Corps of Engineers.

Mr. HIGGINS. Next I would introduce Major General Dreyfus who heads up all the Signal Corps.

Senator SPARKMAN. General Dreyfus, we are glad to have you.

STATEMENT OF MAJ. GEN. JAMES DREYFUS, ACTING CHIEF SIGNAL OFFICER, ACCOMPANIED BY JEAN JAQUETTE, CHIEF SMALL-BUSINESS ADVISER, AND COL. OLIN BELL, CHIEF, PROCUREMENT BRANCH, OFFICE OF CHIEF SIGNAL OFFICER

General DREYFUS. Mr. Chairman, I also will submit my prepared statement and hit some of the high spots.

Senator SPARKMAN. That will be done.

General DREYFUS. I am pleased to make this second appearance before your committee. Major General O'Connell, Chief Signal Officer, is in Europe. I am substituting for him. My normal position is Chief of Procurement and Distribution, which I stated in my brief appearance before the committee last year, is that I am responsible for staff supervision of the signal supply system. At the previous hearings, General O'Connell and I related in considerable detail the operation of the small-business program within the United States Army Signal Corps. Copies of the report of those hearings were made available to all of our contracting officers and small-business specialists. Emphasis on the program has been increased throughout the procurement operation.

I wish to indicate the scope of the activity of the Signal Corps in the field of missile procurement. Because of our participation in the development of projectile and meteorological tracking devices and target acquisition equipment the Signal Corps became responsible for the development and procurement of the Missile Master. This systems device is a fixed anti-aircraft defense system and is now in the production stage. We are also developing a mobile system for similar purposes.

In addition to the above equipments, the United States Army Signal Corps has provided ground support, under 10 contracts, in the form of highly specialized components, assemblies, or services, directly to the development of specific missiles. Five of these ten contracts involving 54 percent of the value went to small-business firms. These are listed in the Department of the Army compilation on the individual missiles.

Fifty-five contracts of a research and development nature entered into by the Signal Corps, were missile-allied but were not specifically assignable to particular missiles. These are ground-support operations of general application to resolve problems, produce special refined and dependable parts or components, or to supply technical assistance.

Of these, 8 or 18 percent of the total value were assigned to small-business firms, and 5 went to educational institutions.

This is all I have to say.

Senator SPARKMAN. Thank you, General Dreyfus.

General DREYFUS. I might mention one thing. I have Mr. Jean Jaquette, the small-business adviser to the chief signal officer, and Col. Olin Bell, my staff assistant on procurement, with us today.

Senator SPARKMAN. Thank you, sir.

(The full prepared statement of Maj. Gen. James Dreyfus reads as follows:)

STATEMENT BY MAJ. GEN. JAMES DREYFUS, ACTING CHIEF SIGNAL OFFICER

Senator Smathers, Mr. Chairman, and gentlemen, I am Gen. James Dreyfus, acting chief signal officer.

I am pleased to make this second appearance before your committee. Major General O'Connell, the Chief Signal Officer is, as he advised Senator Smathers, on an overseas trip and I am substituting for him.

My position in the United States Army Signal Corps is Chief of the Procurement and Distribution Division. As I stated on my previous appearance before this committee on July 30, 1957, I am responsible for the staff supervision of the Army Signal supply system, which includes storing and issuing of all items for which the Signal Corps has logistic responsibility, the procurement of new items, the replenishment of stocks, contracting for research and development in those areas where the Signal Corps has the responsibility; in such areas as communications equipment, combat surveillance, target acquisition, meteorology and allied fields.

At the previous hearings General O'Connell and I related in considerable detail the operation of the small-business program within the United States Army Signal Corps. Copies of the report of those hearings were made available to all of our contracting officers and small-business specialists and emphasis on support of the program has been increased throughout the procurement operation.

I am here today to supply answers to certain questions asked by Senator Smathers in his letter of March 28, 1958, to Mr. McElroy, the Secretary of Defense.[1] The questions applicable to this service were assigned by Department of the Army and appear on pages 2 and 3 of the letter, in paragraph 6, subparagraphs E, F, and H (items 1 and 3). Before taking up the questions, I wish to indicate the scope of activity of the United States Army Signal Corps in the field of missile procurement. Because of our participation in the development of projectile and meteorological tracking devices and target acquisition equipment the Signal Corps became responsible for the development and procurement of the Missile Master. This system device is a fixed antiaircraft defense system and is now in the production stage. We are also developing a mobile system for similar purposes.

In addition to the above equipments the United States Army Signal Corps has provided ground support, under 10 contracts, in the form of highly specialized components, assemblies or services, directly to the development of specific missiles; 5 of these 10 contracts involving 54 percent of the value went to small-business firms. These are listed in the Department of the Army compilation on the individual missiles.

Fifty-five contracts of a research and development nature, entered into by the Signal Corps, were missile-allied but were not specifically assignable to particular missiles. These are ground support operations of general application to resolve problems, produce special refined and dependable parts or components, or to supply technical assistance.

I will now take up the specific questions raised in Senator Smathers' letter, and the statement on each. If time will permit, I will read them as prepared, or they may be submitted for the record. I will be most happy to answer any additional questions, or will secure answers if I cannot answer them. I have some of my people here who are familiar with our procedures and contracting activities.

UNITED STATES ARMY SIGNAL CORPS STATEMENT

Topics of interest listed in sixth paragraph of letter, Senator Smathers to Secretary of Defense, March 28, 1958 (as assigned per D/F, DCSLOG, April 8, 1958, subject, Senate Small Business Committee Proposed Hearings, par. 5).

Item paragraph 6 of letter:

E. Policies governing missile research and development contracting.

Statement

It is the policy of the United States Army Signal Corps to place missile or missile-allied research and development contracts with those individuals, firms or organizations who, on the basis of information available to the purchasing office and the United States Army Signal Research and Development Laboratories, are best qualified to perform the required research and development, and who submit the most acceptable proposal, considering price and other factors, particularly the scientific and engineering approach to the problem.

E.1. Negotiated versus advertised bidding.

[1] Senator Smather's letter of March 28, 1958, reproduced in this record as Appendix 2, p. 227.

Statement

United States Army Signal Corps procurements of research and developmental services and studies and/or first production developed items is usually effected by negotiation. Technical requirements for basic research or applied development must of necessity be confined to broad outlines of areas to be investigated or objectives to be met, in order to take full advantage of the imagination, ingenuity and know-how of civilian research and development organizations. These general requirements usually cannot be specifically defined in terms of completed projects so as to permit procurement by formal advertising.

E.2. Types of contracts being utilized, i. e., cost-plus-fixed-fee, incentive, price redeterminable, etc.

Statement

A review of 55 United States Army Signal Corps missile-allied research and development contracts not assignable to specific missiles indicates that:

Eight are fixed price redeterminable.
Forty-three are cost-plus-fixed-fee.
One is fixed-price.
One is labor-hour.
Two are cost-reimbursable.

E.3. Factors considered in selecting firms to be solicited for bid.

Statement

The following factors are considered by the United States Army Signal Corps in selecting firms to be solicited on research and development contracting:

(*a*) The firm has indicated its desire to participate in Signal research and development by applying for inclusion on the Signal Corps bidder's list or by requesting an opportunity to bid, or has been recommended by the United States Army Signal research and development laboratories.

(*b*) The firm indicates its qualification, or it is known, that it has the technical (and financial) ability.

(*c*) The firm indicates, or it is known, that it has adequate facilities.

(*d*) The firm indicates, or it is known, that it has qualified engineering and scientific personnel.

F. Policies governing missile production contracting.

Statement

It is the policy of the United States Army Signal Corps to place missile or missile-allied production contracts with those firms which on the basis of bids or proposals, as evaluated, are most capable of supplying the product, price, delivery and other factors considered. In the case of new items developed under previous research and development contracts with industrial firms, the developing firm is usually extended preferred status for the first-time procurement, competition considered.

F.1. Government Furnished Equipment versus Contractor Furnished Equipment.

Statement

In the cases of those 10 United States Army Signal Corps contracts, listed in the Department of the Army compilation of missile contracts, under which ground support equipment or services, components, or assemblies were supplied in support of specific missiles, all of the support items were delivered as Government furnished. Analysis indicates that 5 of the 10 contracts were performed by small firms and, including fiscal year 1958 funds applied and expected to be applied by June 30, 1958, will account for 54 percent of the value involved ($1,207,700 out of $2,201,000).

In the case of the Missile Master contract (AN/FSG-1) with The Martin Co., all equipment or services were "contractor furnished" by 15 industrial subcontractors. Included were:

Small firms: 5 (33.3 percent), $664,784 (2.4 percent).
Large firms: 10 (66.7 percent), $26,823,143 (97.6 percent).

F.2. Negotiated versus advertised bidding.

Statement

Procurements by the United States Army Signal Corps under the 10 specific missile service and production contracts were accomplished by negotiation. These contracts involved specialized services or items as follows:

(One) Improved cables and connectors.
(One) Electronics parts evaluation.
(One) Special quartz crystal units.
(Two) Zinc silver oxide battery.
(One) Miniaturized Magnetron X-band.
(Two) Atomic beacon frequency standards.
(One) Radar beacon.
(One) High-shock crystal units.

Procurement of the Missile Master AN/FSG–1 progressed through a negotiated Research and Development contract to a negotiated first-time production contract with the developer.

F.3. Types of contracts being utilized, i. e., cost-plus-fixed-fee incentive. fixed price, price redeterminable, etc.

Statement

A review of the 10 United States Army Signal Corps contracts having application to specific missiles indicates that:

Five are cost-plus-fixed-fee.
Four are fixed price, redeterminable.
One is fixed price.

F.4. Subcontracting programs.

Statement

Regulations require that all United States Army Signal Corps fixed-price contracts over $5,000 include the small-business subcontracting clause (ASPR 7–104–14).

On cost type contracts, all subcontracts over $25,000, or in excess of 5 percent of the prime contract, require review and approval by the contracting officer prior to award by the prime contractor.

F.5. Factors considered in selecting firms to be solicited for bids.

Statement

Factors considered by the United States Army Signal Corps in selecting firms to be solicited for bids in missile or missile-allied production contracting are the same as for procurement in general, giving due recognition to consideration of firms who may have been active in research and development if the item is under first-time procurement.

H. Contracting procedures being followed by the United States Army Signal Corps in connection with each of the following:

1. Ground support equipment for missiles and rockets:

Statement

The United States Army Signal Corps selects contractors for solicitation on the bases described in items E.3 and F.5 above, consideration being given as to the proposed utilization of research and development or production contracts. Thereafter prescribed contracting procedures are used.

3. Contracting for missile detection and warning systems.

Statement

The United States Army Signal Corps contractors are selected on the bases described in items E.3 and F.5 above, consideration being given to the proposed utilization of research and development or production contracts. Thereafter prescribed contracting procedures are used.

Mr. HIGGINS. Now I would like to introduce, sir, Brig. Gen, John Shinkle, who is the deputy commander at Huntsville and gives a greater part of his personal attention down there to what we call the industrial division which deals with the contracting end of the business.

Senator SPARKMAN. Fine. General Shinkle we are glad to have you with us.

STATEMENT OF BRIG. GEN. JOHN G. SHINKLE, COMMANDING GENERAL, ARMY ROCKET AND GUIDED MISSILE AGENCY, HUNTSVILLE, ALA., PRESENTING TESTIMONY COVERING THE ARMY ORDNANCE MISSILE COMMAND, ARMY BALLISTIC MISSILE AGENCY, AND ARMY ROCKET AND GUIDED MISSILE AGENCY

General SHINKLE. Mr. Chairman, it is a real pleasure to be here. For the record I would like to correct my position, I am the commanding general of the Army Rocket and Guided Missile Agency. However, I shall cover the statement of General Medaris for the Missile Command and that of my own, which was to cover the Army Rocket Guided Missile Agency, so-called ARGMA. They are long statements. I will just bring out certain of the highlights.

I think the best thing to start with is the organizational structure. I have a slide (No. 1) showing that structure and I will give you a very short explanation of it. This new organization represents in fact a gathering together of all those agencies within the Army Ordnance Corps which are working essentially on rockets and guided missiles, It gives to the commander the power to use all of these assets in the most efficient and the best manner. (The chart referred to appears on the following page.)

General Medaris has been given command of the Ordnance Missile Command. In effect it gathered together under one head in the field, the old existing Redstone Arsenal, the old existing Army Ballistic Missile Agency, the White Sands Proving Ground, and the Jet Propulsion Laboratory, which is a Government-owned contractor-operated installation in Pasadena. Under the command now, there are 5 agencies: The 4 that I named, which are technical in nature, and the fifth called Redstone Arsenal. The latter in effect furnishes supporting services to the command headquarters and the two organizations ARGMA and ABMA, which are physically located at Redstone Arsenal near Huntsville, Ala.

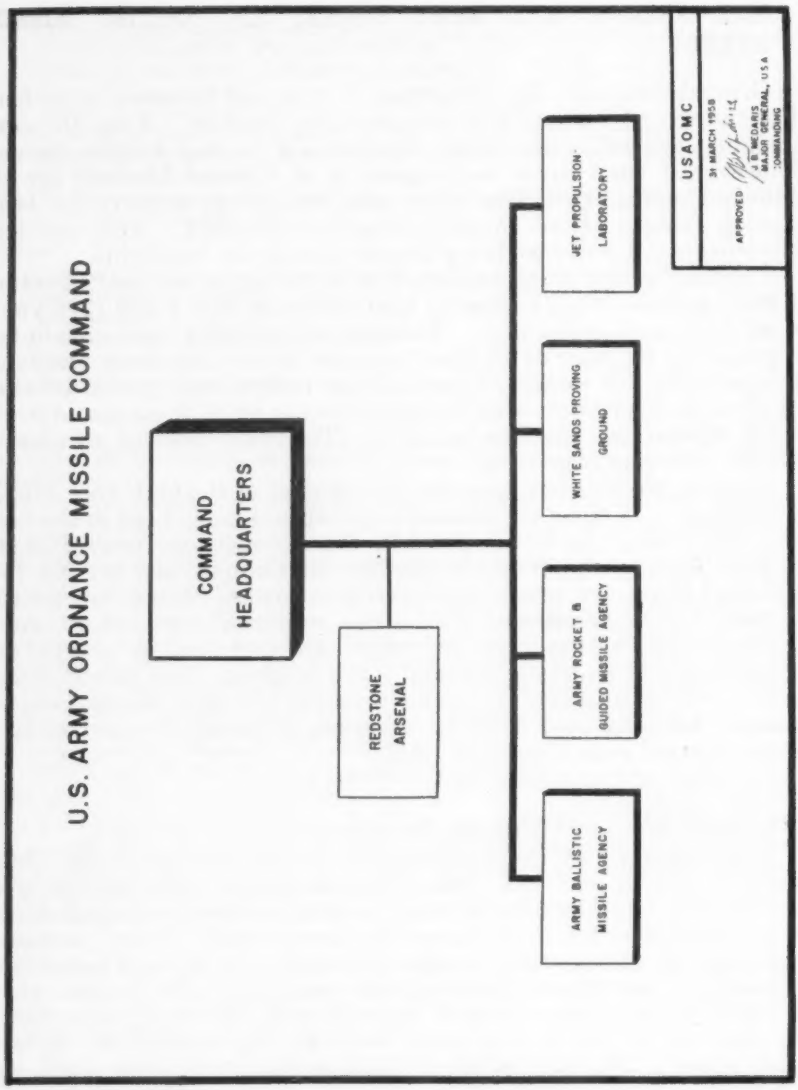
Are there any questions on that slide, sir?

(No response.)

General SHINKLE. Turn off the slide.

The Secretary of Defense received a letter on March 28 asking certain specific questions from this committee. Our answer is an endeavor to be responsive to those specific questions, so I shall discuss the questions rather than discuss the presentation. First question is the role of universities, private industry and other Government agencies in our Army guided-missile programs. In the first place, we have a very heavy research and experimental effort which we try to place in universities and other nonprofit educational and research institutions. This sort of effort depends upon individual people and the ideas of those individuals. As an example, ABMA alone has awarded approximately 40 contracts for research and experimental effort with more than 20 different educational institutions for a total dollar amount of over $17 million. The Jet Propulsion Laboratory, of course, is run under contract with the California Institute of Technology, an educational institution. On this we lean heavily for supporting research and some basic research in the guided-missile business. We intend to continue using it in that category. Other

SLIDE 1


U.S. ARMY ORDNANCE MISSILE COMMAND
COMMAND HEADQUARTERS
REDSTONE ARSENAL
ARMY BALLISTIC MISSILE AGENCY
ARMY ROCKET & GUIDED MISSILE AGENCY
WHITE SANDS PROVING GROUND
JET PROPULSION LABORATORY
USAOMC
31 MARCH 1958
APPROVED
J. B. MEDARIS
MAJOR GENERAL, USA
COMMANDING

Government agencies are used extensively in our guided-missile business. For instance, within the Ordnance Corps we use the Diamond Ordnance Fuse Laboratory, Picatinny Arsenal, the Ordnance Ammunition Command. We lean heavily on the other services of the Army, the Corps of Engineers, the Signal Corps, some of which you have just heard.

Cape Canaveral, the Air Force Missile Test Center, does all the testing for the longer range missiles such as Jupiter and Redstone missile. The White Sands Proving Ground, of course, is another Army installation and as I have just shown, is a part of the Ordnance Missile Command. This we use for the shorter range Army missiles. It is also a three-service range run by the Army as the executive agent and used by the Air Force and the Navy for some of their testing programs.

In discussing the use of private industry, I think I should describe the three general methods we use in developing a missile system. The first method is typified by the Redstone and Jupiter programs. In this we have performed the development and pilot production within the ABMA structure using the very competent group headed by Dr. von Braun. Early in the development we get a commercial contractor to come in and hold hands with our Government group in order that he may very early in the game start his industrial work. Then as the development is completed, the complete package is passed to this commercial contractor, so that large-scale production is performed in a commercial organization, and frees this very competent development group for additional development work.

The other end of the gamut is that which has been used in such system as the Nike system. In this we contracted to a large firm the complete development job, then it is his responsibility to coordinate the development of these complex systems. The role of the Army in this case is to insure that the technical work done by the contractor is along the lines desired by the Army. In between is typified by the Pershing system. In that, the design control is being maintained by ABMA, the Dr. von Braun group, but the work of design and all work that will follow that, such as production, is being performed by commercial contractors. So that is the gamut of our methods of using private industry.

The next question was negotiation versus formal advertising for research, development and production requirements for both missiles and ground equipments. Research and development which is the creation of something that has never been created before, is almost impossible to describe. Therefore, in general, research and development contracts must be negotiated contracts. Systems contracts, since they are development contracts, fall in this same category. However, there are three areas in which we are putting a lot of effort in an endeavor to try to get to the desired type of contract which is advertised. First, we have a very strong standard program. We try to use standard ground vehicles, for instance, so those can be bought on a competitive basis. We standardize spare parts as soon as we can so that they can be bought as common items.

The next area in which we are putting a lot of effort is breakout. The criteria that is essential in order to break out from a major contractor is adequate description of the item which you need to buy. We demand very early in the development process distinct effort

from our contractors to produce adequate documentation, drawings and descriptions and specifications, so that we can break out missiles systems, parts and components, for separate procurement. As an example, in the Honest John program we have had very good success in that the complete missile is broken out into various parts for separate procurement.

Lastly, the spare parts area is the area in which we had the first success in using advertised procurement. Spare parts are small; they are quite often common types of items. We are doing very well in that particular area.

The next question was the question of subcontracting. Inasmuch as the major portion of our guided-missile dollar is allocated to our major prime contractors, the most fertile area for small-business participation in our programs is as subcontractors to our primes. At the time of award of cost-reimbursement contracts, the contractor is required to submit to the Government, for approval, the purchasing policies and procedures to be followed by the prime contractor in his subcontracting program. The prime must submit, among other things, his plan for obtaining of competition, types of contracts utilized, price-analysis procedures, and planned use of small-business concerns. Each of our major prime contractors has in his own employ an individual who is designated as the contractor's small-business specialist. This prime contractor small-business specialist works closely with the small-business specialists in our Ordnance district offices to insure that small business receives a fair share of the prime contractor's subcontractor dollar. Additionally, all of our prime missile contracts contain the ASPR clause (ASPR 7–104.14) urging maximum subcontracting to small business.

The next question concerned types of contracts being utilized. The cost-reimbursement type of contract is utilized almost exclusively for our research and development contracts, and for our initial-production prime contracts. The fixed-priced contract is used extensively by ABMA and ARGMA, either by negotiation or formal advertising, as circumstances dictate, in the procurement of standard items and services to support the in-house research, development, and prototype production effort, and to satisfy missile systems' spare-parts requirements. Time and material, and labor-hour form of contracts are normally undesirable, and are studiously avoided in our procurement procedures. At the present time, there are only four such contracts in existence in support of our programs. "Call" and "open-end" contracts are sometimes used to support recurring requirements for in-house needs where the quantity of the item and the desired delivery schedules, therefore, are indefinite. For example, our fuel requirements for static tests are procured in this manner.

Factors considered in selection of contractors who are to receive bids or proposals: In procuring basic or "pure" research, the primary consideration in selecting a contractor for solicitation of a proposal is the contractor's past experience and present scientific reputation in the specific field of knowledge in which we are interested. Generally, this type of procurement is awarded to the "best qualified" source. Other than known and demonstrated and technical competence in the field of applied research, integrity of the contractor is, probably, the most important consideration. In buying standard or semistandard items, little, if any, difficulty is encountered in the selection of con-

tractors to be solicited for bid or proposal. ABMA and ARGMA, the local purchasing and contracting officer of the Redstone Arsenal post command, and each of the 14 ordnance procurement districts maintain, on a continuing basis, bidders' lists and source files. These files are cross indexed by product or service. In formal advertised procurement, if a bidders' list on a specific item is unusually lengthy and the item is one which was bought fairly repetitively, a rotational method of solicitation is sometimes used. In the procurement of complete missile systems or in the procurement of major components of missile systems, the information contained in our bidders' list and source files on prospective contractors is in considerably greater detail than bidders' list information on the standard items. When a requirement arises for the selection of a contractor for the manufacture or fabrication of a major missile component, or a complete missile system, the following factors are considered: Past experience; corporate management; the quantity, quality, and timely availability of technical personnel; the facilities under control of the contractor; the contractor's management; the contractor's geographical location; and cost.

The next question was, "What is Government-furnished property versus contractor-furnished property?"

It is the announced policy of the Department of Defense to avoid the use of Government funds for the procurement of additional facilities for contractors where there exists open industrial capacity capable of performing the work. It is also our policy that contractors will furnish all facilities required for the performance of our contracts. Within the limitations of existing authority, however, facilities may be provided by the Government for use by contractors when necessary to meet essential production or program schedules, or when otherwise considered to be to the best interest of the Government. Procedures have been established, and have been in operation for some time at the Ordnance Missile Command, whereby all contractor requests for authorization to procure industrial facilities for the account of the Government are carefully screened against available Government stocks so as to preclude procurement of facilities which are already available.

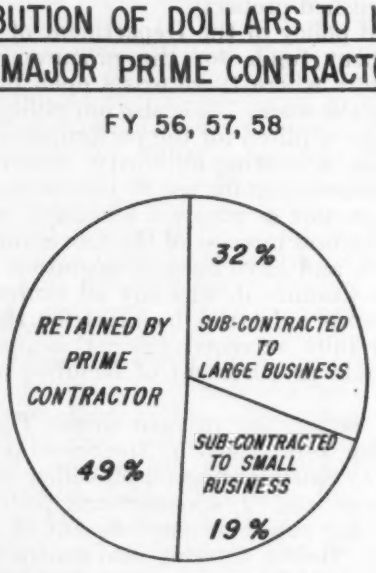
Security-clearance policy for private firms: The Armed Forces industrial-security plan, established by the Secretary of Defense, has a twofold purpose: (1) Safeguarding all classified information in the hands of industrial firms, and (2) standardizing policy procedures and regulations to insure the rapid accomplishment of classified defense contracts themselves. Before entering into contracts or precontract negotiations with industrial firms on military projects involving classified information, it is mandatory that the firm concerned possess a facility security clearance equal to the degree of security assigned to the contract requirement. After determination has been made that an industrial firm has the technical competence and necessary facilities to carry out the contract work, the initiating military installation will forward to the appropriate military department a request for industrial facility security clearance, if one has not been previously established on the contractor. Once a contractor has secured a valid security clearance for a contract, that industrial firm is eligible to receive requests for proposals or awards on other military classified procurements from any of the three military departments. In practically every instance, the contracting agency is in a position to determine a

contractor's ability to meet contract technical requirements for a classified contract without first entering into precontract classified negotiations. Therefore, precontract negotiations are normally conducted, whenever possible, on an unclassified basis. In those cases where classified precontract negotiations are necessary, and contractors to whom requests for proposals will be forwarded do not possess facility clearance, procedures are available through which the necessary clearance can be obtained within a reasonable time after request therefor.

The last question in the letter was on contractual procedures to be used in our outer-space programs. I think I need say nothing more about that than they will be the same contractual procedures which we have used previously.

Mr. Chairman, to finish my summary presentation, I would like to show you about five charts that depict, first, the performance of ABMA, and, secondly, the performance of ARGMA in this field in which we are talking about today. May we have the first chart please?

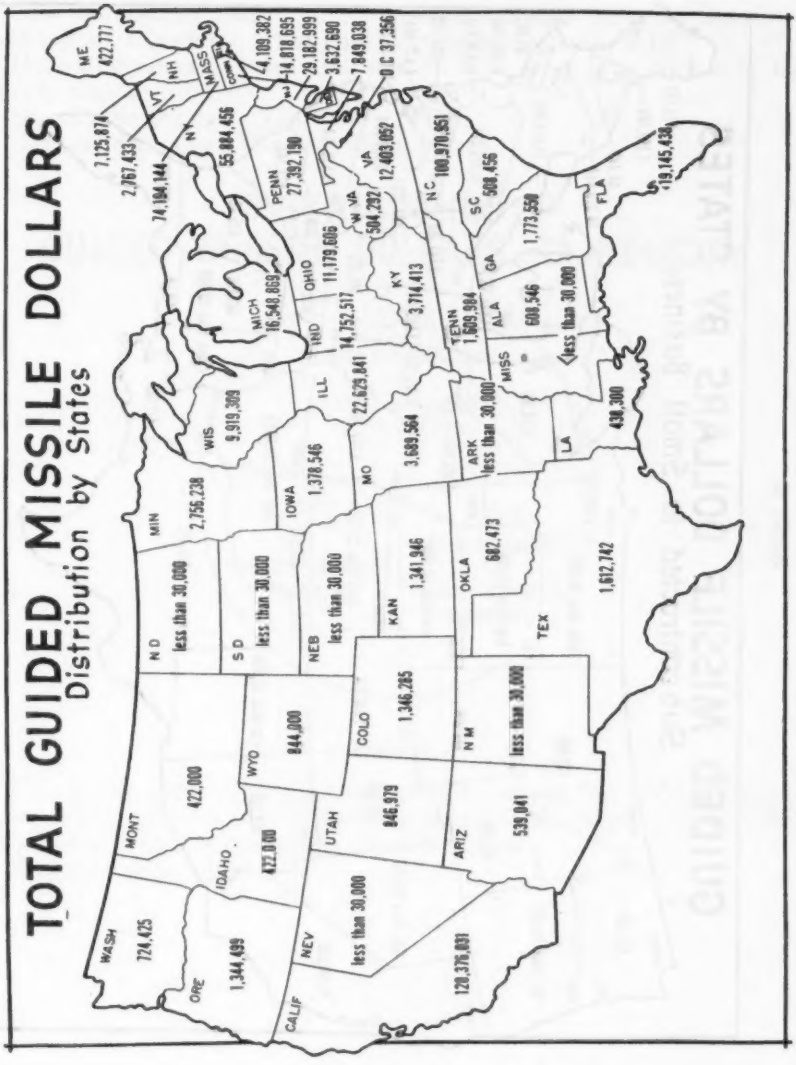
FIGURE 9.



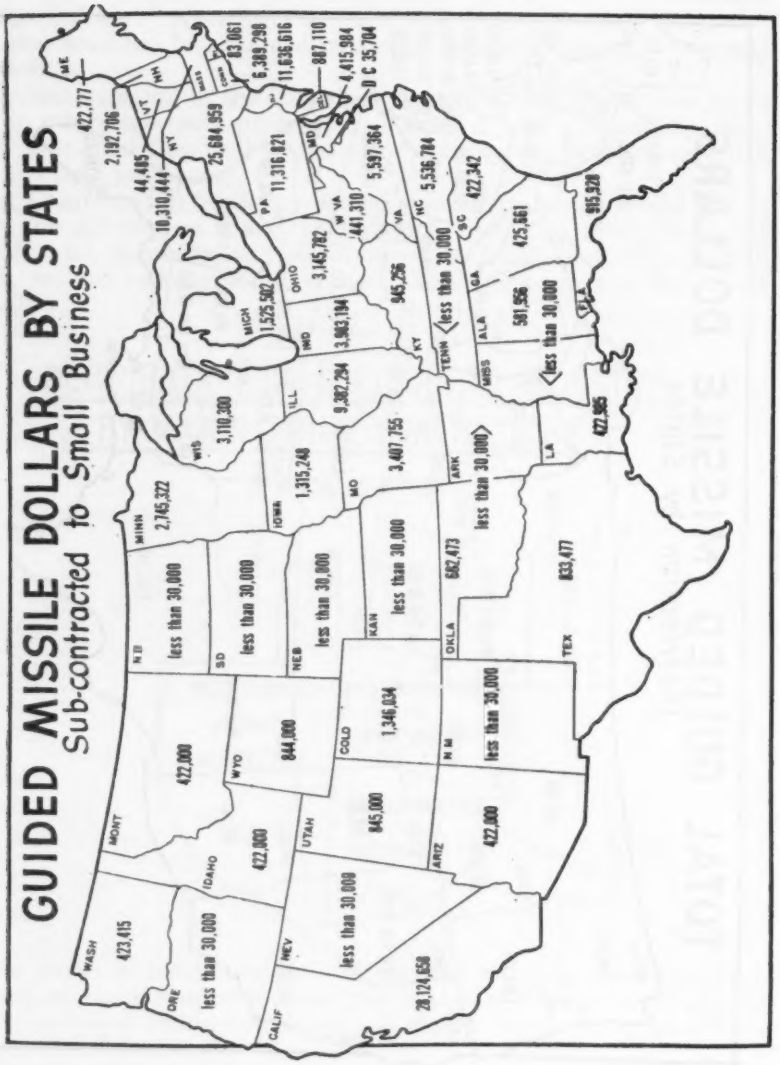
This shows a distribution of dollars that went to industry—that retained by the prime contractor, that which is subcontracted by the prime contractor to large business. It shows 19 percent of all dollars going to small businesses.

The next slide, please.

SLIDE 5.


TOTAL GUIDED MISSILE DOLLARS
Distribution by States
WASH 774,425
ORE 1,344,499
CALIF 120,376,831
NEV less than 30,000
IDAHO 472,000
MONT 422,000
WYO 844,000
UTAH 846,979
ARIZ 539,041
COLO 1,346,285
N M less than 30,000
N D less than 30,000
S D less than 30,000
NEB less than 30,000
KAN 1,341,946
OKLA 682,473
TEX 1,612,742
MINN 2,756,238
IOWA 1,378,546
MO 3,689,564
ARK less than 30,000
LA 430,300
WIS 9,919,309
ILL 22,628,841
MICH 16,548,869
IND 14,752,517
OHIO 11,179,606
KY 3,714,413
TENN 1,609,994
MISS less than 30,000
ALA 608,546
GA 1,773,550
FLA 19,145,438
S C 508,456
N C 100,970,951
W VA 504,232
VA 12,403,052
PENN 27,392,190
N Y 55,884,456
N J 14,818,695
MD 29,187,999
DEL 3,632,690
D C 37,356
MASS 44,109,382
CONN 7,849,038
R I
VT 2,767,433
N H 7,125,874
ME 422,777

SLIDE 6.


GUIDED MISSILE DOLLARS BY STATES
Sub-contracted to Small Business
WASH 423,415
ORE less than 30,000
CALIF 28,124,658
IDAHO 422,000
NEV less than 30,000
MONT 422,000
WYO 844,000
UTAH 845,000
COLO 1,346,834
ARIZ 422,000
N D less than 30,000
S D less than 30,000
NEB less than 30,000
KAN less than 30,000
N M less than 30,000
OKLA 682,473
TEX 833,477
MINN 2,745,322
WIS 3,110,300
IOWA 1,315,248
MO 3,407,755
ARK less than 30,000
LA 427,365
ILL 9,387,294
MICH 1,525,502
IND 3,983,194
OHIO 3,145,782
KY 945,256
TENN less than 30,000
MISS less than 30,000
ALA 581,556
GA 425,661
S C 895,528
N C 5,536,784
S C 422,342
W VA 441,310
VA 5,597,364
PA 11,316,621
N Y 25,684,859
VT 2,192,706
MAINE 422,777
MASS 44,405
CONN 83,061
N J 10,310,444
MD 6,389,298
DEL 11,636,616
D C 35,704
1,415,984
887,110

Senator SPARKMAN. That is the State that Senator Thye referred to, isn't it.

General SHINKLE. Yes, sir; and we have a list of those small contractors, if you wish them, sir.

Slide No. 5 shows the distribution, by State, of the guided-missile money to all business.

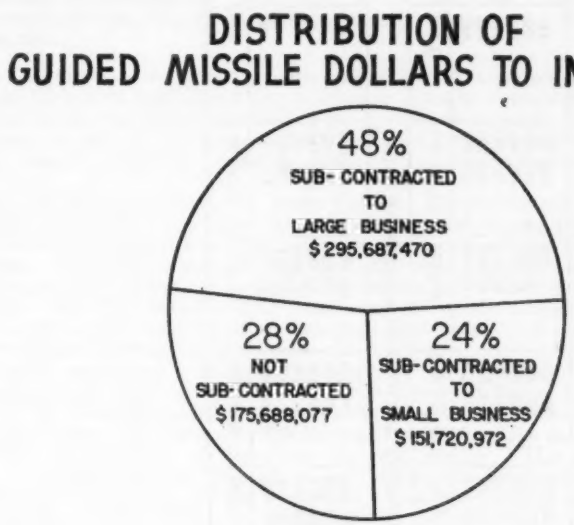
The next slide, please. This is small business only, by State.

Senator SPARKMAN. That chart is not in the book, is it?

General SHINKLE. I am almost sure it is, sir. It is slide 6 in the article presentation, sir.

Senator SPARKMAN. Yes.

General SHINKLE. The next slide, please.



SLIDE 7.

This is the same type pie chart that I showed for ABMA. However, this applies to the ARGMA portion of the work. You notice 24 percent is subcontracted to small business.

The next slide, please.

SLIDE 8

Purchasing and Contracting Division, Redstone Arsenal, July through December 1957 (local actions only)

PROCUREMENT ACTIONS LESS THAN $10,000

	Total dollars	Large business		Small business		Number of actions		Percent by dollars to small business	Percent by number to small business
		Formally advertised	Negotiated	Formally advertised	Negotiated	Large business	Small business		
July	592,003	46,377	201,814	34,152	309,660	442	1,449	42	77
August	870,922	21,123	335,398	97,731	416,670	580	1,753	59	75
September	874,183	38,990	297,204	64,021	473,968	638	1,825	62	74
October	1,012,378	23,532	349,073	67,013	572,760	718	2,219	63	76
November	635,124	15,992	238,643	40,207	340,282	548	1,633	60	75
December	949,860	13,894	335,098	72,599	528,269	646	1,863	63	74
Total	4,934,470	159,908	1,757,230	375,723	2,641,609	3,572	10,742	61	75

PROCUREMENT ACTIONS IN EXCESS OF $10,000

July	2,021,867	391,941	770,030	467,894	392,002	46	51	43	53
August	861,090	73,026	657,031	None	131,033	33	19	15	37
September	1,383,547	536,877	552,597	42,587	251,486	44	30	21	41
October	1,473,362	328,769	917,400	35,023	192,170	37	29	15	44
November	1,446,330	142,523	1,115,916	58,951	128,941	42	16	13	28
December	2,824,289	81,600	2,348,897	242,775	151,017	40	26	14	39
Total	10,010,485	1,554,736	6,361,870	847,230	1,246,649	242	171	21	41

This chart is in the presentation. It is a little difficult to read here. There is a significant amount of money spent locally at Redstone Arsenal. This includes supplies to run the arsenal itself and also includes the money that goes from the ARGMA into spare parts. The factors here show the division between large and small business.

Mr. Chairman, that finishes my summarization of my statement.

Senator SPARKMAN. Thank you, General Shinkle. I want to say that I think the slides which you have shown us are most interesting and show a very clear story.

(The full prepared statements of Maj. Gen. J. B. Medaris and Brig. Gen. John G. Shinkle read as follows:)

PREPARED STATEMENT OF MAJ. GEN. J. B. MEDARIS, COMMANDING GENERAL, UNITED STATES ARMY ORDNANCE MISSILE COMMAND, WITH ACCOMPANYING CHARTS

Mr. Chairman, members of the committee, I welcome this opportunity to discuss with you how the Army Ordnance Missile Command has organized for the job of developing and producing guided-missile systems, some of the methods and tools we use in performing our mission, and the participation by small business in our missile programs. First, an explanation of how we have organized for the job.

Prior to the creation of the Army Ballistic Missile Agency at Huntsville, Ala., in February 1956, all surface-to-surface and surface-to-air missile systems assigned to the Department of the Army were being prosecuted by the then Redstone Arsenal. In 1955, there were repeated expressions of national concern over the absence in our arsenal of weapons of an operable intermediate-range ballistic missile. The Department of Defense assigned to the Department of the Army, on a crash basis, the task of researching, developing and producing the Jupiter intermediate-range ballistic missile. In order to immediately direct a portion of the missile know-how existing in the Army to the Jupiter and Redstone programs exclusively, a separate organization, the Army Ballistic Missile Agency, was created at Huntsville, Ala. Missiles such as the Lacrosse, the Honest John, the Little John, the Corporal, the Sergeant, and the Nike family of missiles were left the responsibility of Redstone Arsenal proper. The new ballistic-missile agency concentrated its attention on completing the development of the Redstone missile system, and on getting underway a program for developing and producing the Jupiter. Subsequently, a portion of the national satellite effort was assigned to ABMA.

In view of the meteoric growth of this young giant we call the missile business, the onrush of technological advances in so many of the physical arts, and the fact that each new weapon system tends to become far more complicated and intricate than its predecessors, the Army, in 1957, performed a reappraisal of the organization within the Army that was to perform our missile tasks. The result was the determination that the guided-missile programs assigned to the Department of the Army needed an overall systems manager to guide, counsel, coordinate, and monitor this giant missile complex. The outcome was the establishment, on March 31, 1958, of the United States Army Ordnance Missile Command. This Command comprises, as shown on this chart (slide 1)(see p. 162) the Army Rocket and Guided Missile Agency (which was formerly part of the Redstone Arsenal), the Army Ballistic Missile Agency, the Jet Propulsion Laboratory of the California Institute of Technology, and the White Sands Proving Ground. Redstone Arsenal is now the name applied to a small organization in the command charged with the responsibility of satisfying administrative needs of the portions of the command located at Huntsville. Thus, provost marshal duties, housekeeping, post engineer functions, communications, are the responsibility of RSA.

The creation of the Army Ordnance Missile Command will centralize many overhead functions now being performed by each of the agencies, and place them at Command level, without increasing, by such action, the overall size of the entire complex. It is, in fact, a consolidation, under one Commander, of all activities relative to the prosecution of Army assigned missile programs. The latter is my job. That job is to insure the maximum effective use of all the resources available to the Army, and to create an intersupporting and interrelated organization which will assure the speedy and efficient attainment of our assigned missile objectives. It is my opinion that, of all the events which have occurred

in the past few years in the missile field, this seeingly undramatic consolidation is the most demonstrative evidence of the size, the tremendous expanse, and the growing importance of the scientific and missile weapons field. The Army is currently managing 15 major missile weapons systems in all of their aspects, from research, design, development, and prototype production to industrial production, industrial engineering, product improvement, testing, storage, and maintenance in the field. We train directly or contribute to the training of the troops who will actually man these systems, and all service personnel who will maintain the weapons and associated equipment in operable condition.

The various commands of the Ordnance Corps have for some years been organized on so-called commodity lines. AOMC is responsible for its assigned weapons and associated equipment from the inception of the missile concept itself, to the actual flying of the bird. But the weapons and their associated equipment do not alone make them an integral part of the Army system. There are literally hundreds of items and services which must be contributed to the entire system from other sources within the Ordnance Corps and the other technical services of the Army, such as Signal, Chemical, Quartermaster, and Engineer Corps. The resources which must be utilized include the resources of decision at the Washington level, the resources of training in the hands of the various technical services, etc. The systems manager, AOMC, cannot, of course, direct all of the actions to be taken within the command complex necessary to make the weapon system a functioning one. Yet, the systems manager has the responsibility for policy guidance, for monitoring this entire complex, guaranteeing that the prescribed time schedules are met, and that all available sesources are properly utilized. It is my responsibility as systems manager to "knock heads" together to insure that all deficiencies in our program are cured, and that all obstacles with which we may be confronted are removed either by my independent action, or, if necessary, obtaining the assistance of my superiors in Washington. This Army missile complex has grown to such vast proportions, into every area, every facet of America and its economy, and even beyond our shores, that it was obviously mandatory that an organization be established to monitor and manage this entire complex and insure the maximum effective utilization of the vast resources at our disposal.

Mr. Chairman, your letter of March 28, 1958, addressed to the Secretary of Defense, relative to this hearing, identified certain topics which the committee desired to be covered in the presentations made by each of the military services. I shall now discuss these topics, in the following order:

(*a*) The role of universities, private industry, and other Government agencies in our Army guided missile programs.

(*b*) Negotiation versus formal advertising for research, development, and production requirements for both missiles and ground equipment.

(*c*) Subcontracting.

(*d*) Types of contracts being utilized.

(*e*) Factors considered in selection of contractors who are to receive bids or proposals.

(*f*) Government-furnished property versus contractor-furnished property.

(*g*) Security clearance policy for private firms.

(*h*) Contractual procedures to be used in our outer space programs.

At the conclusion of my narrative statement, I will present to you statistical data on approved and planned missile and space programs assigned to our Army Ballistic Missile Agency, and statistical information concerning small-business participation therein. Later in this hearing, General Shinkle, commander of the Army Rocket and Guided Missile Agency, will present statistical information on the approved and planned missile programs of ARGMA, and small-business participation in those programs.

Included in the material submitted to your committee by the Army are fact sheets describing some of the characteristics of each of the missile systems and space projects assigned to my command.[1] At the conclusion of our written presentations, I and General Shinkle will be glad to attempt to answer any questions which you may desire to ask us relative to the missile systems and other projects assigned to the ABMA and ARGMA, to the extent that such information is unclassified.

First, the roles played by universities, Government installations, and private industry in the Army's missile projects.

(*a*) We have strived to use to the utmost the tremendous store of knowledge possessed by scientific and engineering personnel engaged in work for nonprofit educational and research institutions in this country. Since its activation in 1956,

[1] See exhibit 16 (a) through 16 (g) beginning p. 186.

ABMA alone has awarded approximately 40 contracts for research and experimental effort with more than 20 different educational institutions, for a total dollar amount of over $17,200,000. These contracts call for effort in such areas as analysis of system accuracy of missile tracking, climatological observation studies, telemetering and measuring research, study of vibrational behavior of a missile, aerodynamic damping principles, determination of electron densities of the Ionosphere, liquid motion studies, effect of meteors upon missiles outside earth's atmosphere, aerodynamic heat studies, development of missile defect reporting systems, etc. As I previously mentioned, the Jet Propulsion Laboratory of the California Institute of Technology, is now a part of my command. It has played a significant role in the development of many of our weapons systems, many of them representing pioneer efforts in the missile field. Its primary task is the performance of the supporting research which makes it possible for us to keep ahead in the advancing technological fields associated with missile work. JPL tells us what we need to know before we need to apply it. It is a Government-supported laboratory operated primarily for my command and employs over 2,000 scientists, engineers, and technicians who have made outstanding contributions to the advancement of the art of rocketry. We shall continue to avail ourselves of the tremendous creative power existing in JPL and all other research and educational institutions.

(*b*) Existing military installations and facilities of the Department of Defense are in very active use in our Army missile programs. The Air Force Missile Testing Center at Cape Canaveral, Fla., is used for the launching of our Jupiter, Jupiter C, and Redstone missiles. A part of my command, the White Sands Proving Ground in New Mexico, is also used extensively. It is a tremendous installation, covering approximately 4,000 square miles. Its principal mission is the testing of rockets and guided missiles within its range capability. It operates for the Department of Defense an integrated range for all three military services, with the Army acting as the executive agency.

The Bureau of Ordnance of the Navy Department is performing aerodynamic research studies for application to our Jupiter missile and performs guidance systems sled tests and gyro tests under military interdepartmental purchase requests. Our Redstone fire-unit proficiency analyzer was developed by the Training Devices Center of the Department of the Navy. Within the Army, the Signal Corps, the Engineer Corps, the Chemical Corps, and the Quartermaster Corps are actively engaged in performance of effort in support of our guided missile programs. Within the Army Ordnance Corps, we are presently making extensive use of the special talents possessed by Detroit Arsenal, Diamond Ordnance Fuze Laboratories, Frankford Arsenal, the Ordnance Weapons Command, the Ordnance Guided Missile School, the Ordnance Tank Automotive Command, Picatinny Arsenal, Rock Island Arsenal, Watertown Arsenal, etc. We shall continue to make full use of existing military installations and military know-how in those cases where it is demonstrably in the best interest of the Government to do so. At the same time, we have and shall continue to avoid conscientiously the placing of work with Government facilities where large or small industry is equally capable of performing the job. The bulk of our guided missile dollars goes to private industry. This will be discussed in subsequent portions of my presentation.

In discussing formal advertising versus negotiated procurement, I shall commence by discussing the three separate approaches now being utilized in my command. First, let us examine the approach being used for the procurement of the Redstone and Jupiter ballistic-missile systems. Here we have the complete capability, "in-house" in the Army Ballistic Missile Agency at Huntsville, to carry a system from its initial concept through design, development, prototype testing, and prototype manufacture. Here we are utilizing to the maximum the enormous store of scientific and engineering know-how and ingenuity accumulated by Dr. Wernher von Braun and his team of scientists in more than 25 years of rocket experience. Concurrently, we utilize, by contract, special talents and skills of industrial firms and educational institutions to support our in-house research, development, and research and development prototype-production efforts.

During the period in which research and development of the missile system is being carried on in house by ABMA, the prime missile system contractor is selected. The contractor then runs parallel to our in-house effort, becoming familiar with the approaches, methods, and techniques being used at ABMA. After prototype production, the new prime contractor is given the complete production job, which we at ABMA do not desire to assume since it is properly within the province of private industry. To do otherwise would inhibit the

unobstructed use, on other high priority programs, of our in-house creative technical resources.

On the other end of the spectrum, we have examples of certain missile systems, such as the Nike family of missiles, the Honest John, the La Crosse, etc. (the responsibility of our ARGMA), where the development and production contract for the entire missile system is awarded to a prime contractor after completion of concept and feasibility studies, establishment of Army requirements, and spelling out of essential military characteristics. Government technical and administrative personnel maintain surveillance over the contractor's effort, and monitor the entire program. The research, development, and production effort, however, is either performed by the prime contractor at his own plants or through subcontracts. There is no large scale Government in house effort under such an arrangement. This system is commonly used in the smaller, high-density missiles.

The third approach in procurement of guided-missile systems is exemplified in the recent award of the Pershing missile to the Martin Co. of Orlando, Fla. The Pershing is in the middle of the spectrum and typifies an in-between approach. This third approach embodies the retention by AOMC of technical supervision and design control over the research and development effort exerted by the prime contractor. The prime contractor actually develops the hardware and there is little or no in-house fabrication or assembly of prototypes. By the exercise of technical supervision and design control, the Government insures the judicious use of the substantial AOMC technical and scientific know-how that is one of the distinctive resources possessed by my command. This industry-Government team approach assures to the fullest extent the coordinated use of the special and peculiar talents possessed by both.

Now let us go back for a moment to discuss some of the details of procurements involved in the first approach, as typified by ABMA's Redstone and Jupiter missile systems. Here, ABMA is the prime contractor in the research, development and initial prototype fabrication stage. There are many standard and semistandard items which must be procured to support the ABMA in-house effort. These items are procured either by formal advertising or by negotiation, depending on the circumstances involved. For instance, even though an item is standard, it may be a proprietary item and would of necessity be negotiated.

In addition to the standard items, we procure pure or basic research, the awards normally being placed with educational or research institutions. Here we are buying the brainpower of a specific individual or group of individuals in universities, research foundations, and industry. This is the type of research that has as its purpose the gaining of new or expanded knowledge of the basic law of nature. It is normally not directed to any specific weapons system or scientific project. Some of the educational and research institutions performing basic research for ABMA do qualify in the category of small business. Negotiation is the only feasible method to be used in this type of procurement.

ABMA buys applied research. This type of research is directed toward the advancement of the state of the art in selected technical areas. Although not necessarily directed toward the development of specific hardware, it is directed toward technqiques which will be applied to later development of items of material. A large portion of this research is of a type that can be and is handled by small business. For instance, exluding our major Redstone and Jupiter prime contractors, out of 1,669 separate in-house procurement actions in fiscal year 1957 and the first 8 months of fiscal year 1958, 1,574 were actions of an individual value of less than $100,000. Many of these 1,574 procurement actions represented applied research effort. Of this total of 1,574 actions, 51.3 percent of the total number went to small-business concerns, and 48.7 percent of the total dollar value went to small-business concerns. Due to the nature of this applied research work, and the absence of complete design information, drawings and specifications, negotiation is the only feasible method of procurement.

Development is the name applied to the evolution of new and improved items of material. For this function, we select industrial producers, for the larger and more complicated components of the missile system, who in turn will later become, for these components, the initial major subcontractors to our prime missile systems contractor. In the development stage, these major component contractors marry their efforts to those being performed in house at ABMA. At this point in the progress of a missile, the prime missile systems contractor is assigned various engineering service tasks.

One of the most important of such tasks is the preparation of drawings and other documentation, substantially in conformity with Government drafting

standards. We in the missile business are compressing or telescoping the time from the determination of the feasibility of a system to the issue to troops of tactical weapons, by accomplishing development and initial production concurrently. As an inescapable result of this compression, drawings and specifications are usually not complete at the beginning of production and procurement of components must of necessity be accomplished by negotiation. We try, however, to secure as rapidly as we can the best drawings which the state of the designs will permit. In these development and initial production stages we demand that our component contractors prepare their documentation in substantial accordance with ordnance standard drafting room procedures, so that complete documentation is available at the earliest possible time. We place especial emphasis on the identification by the contractors of any and all proprietary items, so that, at the earliest possible time, the Government may reject such proprietary components, or commence design of a comparable nonproprietary component for inclusion in the tactical missile.

When missile production is turned over to the prime missile system contractor, this time-compression, this telescoping of the program, is still very much in evidence. Despite concerted efforts to keep engineering change orders to a minimum, there is a constant introduction of mandatory engineering changes into the prime contractor's early missiles. These changes are to cure defects uncovered by flight tests, improve performance and reliability, insure compatibility between various missile components, incorporate necessary safety requirements, and to improve maintainability of the entire system. With the state of the art constantly advancing because of the intensity of the worldwide effort for weapons superiority, we must constantly revise design to provide troops with the most advanced and superior material available. Superiority must not be sacrificed to await the development of perfected drawings and specifications. Oftentimes, the urgency of operational requirements dictate that contracts or subcontracts be let immediately for initial production orders. To delay procurement to permit preparation of production drawings sufficiently complete and detailed to support formal advertising, or even, for competitive negotiation could, in the case of the larger and more complex components, delay entire programs by a year or more. Formal advertising of a requirement which we are sure will be subject to frequent and major changes, with heavy cost impact, is unsound.

When a missile system becomes fairly stable, and fabrication of the "tactical" rounds commence, engineering changes are introduced through a "block" system, with "effectivity," or applicability of changes, limited to missiles within a designated block. This is the logical point to "breakout" a missile component from the systems contractor for competitive procurement by the Government.

In connection with our Redstone and Jupiter missile systems, each major component must be tested and functionally "checked out" by our prime missile systems contractor. The systems contractor assembles the entire missile and is responsible for the compatibility of each and every component of the missile. In such a system, it is not feasible to "breakout" major components for separate procurement by the Government, and shipment to the systems contractor as Government-furnished property. The systems contractor must have the responsibility to monitor each and every change introduced in components, in order to insure compatibility within the entire missile.

In our missile systems, we are striving for an early complete definition of all spare parts requirements, so as to initiate procurement of spare parts, by formal advertising, as soon as practical. For instance, there has been established at ARGMA an organization whose primary mission is to set up purchase of spare parts requirements through the medium of formal advertising. This can be done, of course, only where drawings and specifications are adequate to serve as a basis for competitive bidding.

The foregoing remarks relative to Redstone and Jupiter documentation problems in the development and production stages, are equally applicable to the missile systems assigned to ARGMA.

However, the Nike family, the Honest John, and other ARGMA small-range rockets and missiles lend themselves more readily to controlled breakout of components from the systems contractor, due to the inherent makeup of the missiles. The Honest John is an example of an established rocket where the Government has been able to "breakout" major missile components from the systems contractor, and procure direct from various sources. This has been made possible by the fact that the components divorced from the systems contractor are not required to be mated by the systems contractor prior to shipment to the user. The solid propellent motor, the spin rockets, and the launcher of the Honest

John are now procured directly by the Government, and shipped to the field user, who actually performs the final assembly of the missile. ARGMA has the responsibility to insure that the "mating" of the various components will not be adversely affected by changes introduced into any of the major assemblies or subassemblies. However, any changes in the major assemblies not affecting its mating or marriage with other assemblies do not necesaarily have to be monitored by or procured through the systems contractor.

The foregoing procedures are also applicable to the procurement of ground support equipment for our missiles. This vital checkout and launching equipment contains electrical, hydraulic, mechanical, and especially, electronic components which are so interrelated with the missile itself that compatibility is an overriding consideration. In the case of Redstone and Jupiter, compatibility dictates that the responsibility for engineering and procurement of such items be retained by the systems contractor. There are also items of ground equipment not involving truly complex problems of missile compatibility, such as fuel transporters, certain erection equipment, missile transporters, etc., which our command agencies buy direct and ship to the field user. Lastly, there are other ground equipment items that are procured by other Government agencies, such as generators and liquid oxygen plants from the Corps of Engineers, nuclear warhead adaption kits from Picatinny Arsenal, transport type vehicles from Ordnance Tank Automotive Center, etc. This breakout of missiles and ground equipment, however, does not necessarily imply procurement by formal advertising. Telescoping of the various stages of missile creation is equally applicable to ground support equipment. Development and initial production has been accomplished concurrently on missile simulators, fault isolation trucks, electrical equipment trucks, etc., just as it was on the missiles themselves. Oversea deployment dates have dictated that initial production commence long before adequate production-type drawings were available. In many instances, this has resulted in our contracting with the developer for the first production quantity. Again, in other cases, we have been able to enter into competitive negotiations. In the case of fuel service semitrailers for the Jupiter system, our scope of work consisted of a general specification to which the semitrailers had to conform. The nature of the item was such that detailed drawings were not required in order to permit the preparation of intelligent and responsive competitive proposals. In this procurement, out of several proposals received, the award was made to a small business concern employing 131 people.

Where compatibility is not paramount, and where we can support an item with complete detailed drawings and specifications, we will procure direct, striving wherever possible and feasible to use the formal advertised method. However even when the foregoing criteria is present, we cannot blind ourselves to other important considerations that may dictate the use of negotiation. On large complex components where the Government has made a substantial initial investment requiring an extended period of preparation, and where securing competitive producers might require a duplication of large investments already made, or would unduly delay procurement, negotiation may be in the best interest of the Government. Additionally, it may well be in the best interest of the Government to retain the engineering and other special skills, know-how, and highly technical manufacturing processes of a particular contractor as well as the establishment and maintenance of a highly qualified producer in the interest of industrial mobilization. In other cases components may contain proprietary items which the Government should not, for technical reasons, reject, which cannot be satisfactorily duplicated, and where the cost to the Government in purchasing license rights would be prohibitive. The Congress has noted the appropriateness of negotiation in the instances cited immediately above, and included them among the seventeem (17) separate exceptions permitting negotiation, as enumerated in section 2 (c) of Public Law 413, now title 10, United States Code, section 2304 (a).

SUBCONTRACTING

Inasmuch as the major portion of our guided missile dollars is allocated to our major prime contractors, the most fertile area for small business participation in our programs is as subcontractors to our primes. At the time of award of cost-reimbursement contracts, the contractor is required to submit to the Government, for approval, the purchasing policies and procedures to be followed by the prime contractor in its subcontracting program. The prime must submit among other things, his plans for obtaining of competition, type of contracts utilized, price analysis procedures, planned use of small business concerns, etc. Each of our major prime contractors has, in his own employ, an individual who is desig-

nated as the contractor's small business specialist. This contractor small business specialist works closely with the small business specialists in our ordnance district offices to ensure that small business receives a fair share of the prime contractor's subcontracted dollars. Additionally, all of our prime missile contracts contain the ASPR clause (ASPR 7–104.14) urging maximum subcontracting to small business. The ASPR clause entitled "Subcontracting" (ASPR 7–203.8), which is included in all of our cost-reimbursement type contracts, provides that all cost-reimbursement type subcontracts, all fixed-price subcontracts in excess of $25,000, and all subcontracts for industrial facilities and special tooling in excess of $1,000 must have the written approval of the contracting officer prior to award. This affords our contracting officers a continuing opportunity to evaluate and monitor small business participation in subcontracting.

TYPES OF CONTRACTS UTILIZED

The cost-reimbursement type contract is used almost exclusively for our research and development contracts, and for our initial production prime contracts. There does not as yet exist sufficient historical cost experience and cost data on our missile systems to enable us to estimate costs with the degree of accuracy required for fixed price contracting. In such cases, resort to fixed price contracts is normally not in the best interest of either the Government or the contractor. When a specific missile program has progressed a significant distance into the production stage, many missile components and component parts become stabilized and are subcontracted by the prime on a fixed price, competitive negotiation basis. The same is often true when procuring components for ABMA's in-house prototype production effort. Prime contracting by ABMA, and subcontracting by our major prime contractors for major components of a missile system, such as rocket engines, guidance and control components, etc., will continue to be performed on a cost-reimbursable contract basis, until the entire missile system is stabilized and mandatory engineering changes are the exception rather than the rule.

The fixed price contract is used extensively by ABMA and ARGMA, either by negotiation or by formal advertising, as circumstances dictate, in the procurement of standard items and services to support the in-house research, development, and prototype production effort, and to satisfy missile systems' spare parts requirements. However, contracts providing for basic and applied research or development effort seldom lend themselves to the fixed price form of contracting.

Time and material, and labor hour forms of contracting are normally undesirable, and are studiously avoided in our procurement procedures. At the present time, I know of no more than four such contracts in existence in support of our programs. These are for engineering design and drafting services, and the services of missile training instructors, for ABMA in-house requirements. The time and material type contracting is appropriate for this type of work.

"Call" and "Open-end" type contracts are sometimes used to support recurring requirements for our in-house needs, where the quantity of the item and the desired delivery schedules therefor are indefinite. For example, our fuel requirements for static tests are procured in this manner.

The cost-plus-incentive type contract is not used by my command. This type contract rewards a contractor for efficient and economical performance by allowing, through a negotiated formula in the contract, the contractor's fixed fee to go up or down based on expenditure of estimated cost in the contract. To prevent a contractor from realizing an exorbitant profit under such formulae, this system needs extremely accurate historical cost experience, so that anticipated costs can be estimated with a high degree of accuracy. If such accurate information is available, then it would appear that the finest of all incentive type contracts, the fixed price, should be used.

FACTORS CONSIDERED IN THE SELECTION OF CONTRACTORS FOR SOLICITATION OF BIDS AND PROPOSALS

In procuring basic or pure research, the primary consideration in selecting a contractor for solicitation of a proposal is the contractor's past experience and present scientific reputation in the specific field of knowledge in which we are interested. Generally, this type of procurement is awarded to the "best qualified" source. Various universities and research institutions specialize and concentrate on investigations and inquiries in specific fields of technology. It is also true that this specialized knowledge is generally possessed by only 1 or 2 specific individuals in such institutions. Oftentimes the ideas involved in our proposed

procurement originated within a specific educational institution or private firm, and is oftentimes proprietary to that institution or firm. It is essentially the peculiar knowledge and investigative enthusiasm of a specific individual or group which we are seeking to buy, and criteria to be used in evaluating competitive proposals are not easily determined, and even more difficult to apply.

Other than known and demonstrated technical competence in the field of applied research, integrity of the contractor is probably the most important consideration. This factor of integrity is of tremendous importance, due to the fact that this type of work is generally performed under a cost-reimbursement-type contract where the contractor's obligation to the Government is to utilize its "best efforts" toward attainment of objectives outlined in the scope of work of the contract. In such contracts, the contractor's fixed fee is computed on the basis of the contractor supplying to the Government, for a stated period of time, a "level or rate of effort" expressed in terms of so many engineering and manufacturing man-hours. In buying standard or semistandard items, little, if any, difficulty is encountered in selection of contractors to be solicited for bid or proposal. ARGMA, ABMA, the local purchasing and contracting office of my Redstone post command, and each of our 14 ordnance procurement districts maintain, on a continuing basis, bidders' lists and source files. These files are cross indexed by product or service, and reflect whether the firm is large or small business, etc. In formal, advertised procurements, if a bidders' list on a specific item is unusually lengthy and the item is one which is bought fairly repetitively, a rotational method of solicitation is sometimes used. This would mean that 50 percent of the companies on the lists would be included in the invitation for bids for this month's procurement, and the other 50 percent would be invited to bid on next month's procurement.

In the procurement of complete missile systems or in the procurement of major components of missile systems, the information contained in our bidders' lists and source files on prospective contractors is in considerably greater detail than bidders' lists information on standard items. The files are separated by specific items in a missile system, such as electronics, ballistic shells, spin motors, JATO's, ground-support equipment, etc. They contain complete information on the company, the number of separate plants in the company, their location, number of square feet in each plant, information on subsidiary companies, amount, type, and location of industrial facilities owned or leased by the company, past experience of the company in the various categories of missile work, present capability in terms of quantity and quality of manpower available, etc. When a requirement arises for the selection of a contractor for the manufacture or fabrication of a major missile component or a complete missile system, the following factors, among others, are considered in determining to whom requests for proposals will be sent:

(*a*) Past experience in development and production, especially as it relates to guided missile systems.

(*b*) Corporate management.
- (1) Top-level enthusiasm for the program.
- (2) Corporate organization to handle the program.

(*c*) The quantity, quality, and timely availability of technical personnel in such areas of development, production engineering, drawings and other documentation, quality assurance, testing and evaluation, repair parts, etc.

(*d*) Facilities.
- (1) Plant.
- (2) Availability for program.
- (3) Permanence of availability.
- (4) Ownership.
- (5) Mobilization assignment.
- (6) Need for Government financial assistance.

(*e*) Management.
- (1) Availability for program.
- (2) Ownership.
- (3) Mobilization assignment.

(*f*) Geography.

(*g*) Cost.

GOVERNMENT-FURNISHED PROPERTY VERSUS CONTRACTOR-FURNISHED PROPERTY

It is the announced policy of the Department of Defense to avoid the use of Government funds for procurement of additional facilities for contractors where there exists open industrial capacity capable of performing the work.

It is also our policy that contractors will furnish all facilities required for the performance of our contracts. Within the limitations of existing authority, however, facilities may be provided by the Government for use by contractors when necessary to meet essential production or program schedules, or when otherwise considered to be in the best interest of the Government.

Procedures have been established, and have been in operation for some time at my command, whereby all contractor requests for authorization to procure industrial facilities for the account of the Government are carefully screened against available Government stocks, so as to preclude procurement of facilities which are already available.

In negotiated procurements, the possession by contractors of contractor-owned facilities adequate to perform the contractual requirement is an important factor in selection of contractors.

In formal, advertised procurements a bidder who plans to use Government-furnished property in the possession of the bidder, in prosecution of the scope of work contained in the invitation for bid must, in order to be considered responsive, include with his bid documentary evidence of the existence of a binding lease or other rental agreement with the Government covering such property, accompanied by a statement that such lease or rental rates were agreed to by the contractor and the Government in accord with existing regulations covering the establishment of such lease and rental rates.

SECURITY-CLEARANCE POLICY FOR PRIVATE FIRMS

The Armed Forces industrial security plan, established by the Secretary of Defense, has a twofold purpose; (1) safeguarding all classified information in the hands of industrial firms, and (2) standardizing policies, procedures, and regulations to insure the rapid accomplishment of classified defense contracts themselves.

Before entering into contracts or precontract negotiations with industrial firms on military projects involving classified information, it is mandatory that the industry concerned possess a facility security clearance equal to the degree of security assigned to the contract requirement. After determination has been made that an industrial firm has the technical competence and necessary facilities to carry out the contract work, the initiating military installation will foreward to the appropriate military department a request for industrial facility security clearance, if one has not been previously established on the contractor. Once a contractor has secured a valid security clearance for a contract, that industrial firm is eligible to receive requests for proposals or awards on other military classified procurements from any of the three military departments.

The military department issuing the security clearance normally becomes the cognizant security office. As such, it is responsible for exercising control over all industrial security matters pertaining to that particular industrial firm. This responsibility continues for all future classified contracts negotiated between that facility and agencies of the Department of Defense. Before issuing a security clearance, the cognizant office must make a physical survey of plant facilities to determine the ability of that specific industry to properly store and safeguard classified information, to determine that that industry has no compromising foreign ties, and that its key employees are eligible for a personal security clearance.

In practically every instance, the contracting agency is in a position to determine a contractor's ability to meet contract technical requirements for a classified contract without first entering into precontract classified negotiations. Therefore, precontract negotiations are normally conducted, whenever possible, on an unclassified basis. In those cases where classified precontract negotiations are necessary, and contractors to whom requests for proposals will be forwarded do not possess facility clearances, procedures are available through which the necessary clearance can be obtained within a reasonable time after request therefor.

PROCUREMENT PROCEDURES FOR OUTER-SPACE PROJECTS

The procurement procedures to be used in all aspects of our outer-space projects will most likely be the same as one or more of those enumerated above. There will, unquestionably, be an ever-increasing number of basic- and applied-research contracts awarded to educational and research institutions and private enterprise. It would also appear logical that, entering into these novel and arresting new space projects, our goals and objectives spelled out in the scopes of work in our contract documents will be couched in such necessarily broad language that the

cost-reimbursement-type contract will be extensively used. There will, most likely, be a continuing need for the procurement of standard and semistandard items and services in support of the command's in-house research and development effort. I do not presently foresee that the factors to be considered in selecting contractors will be markedly different from those that are presently used in our missile programs.

I will now present statistical data on our ABMA programs, including information on small-business participation therein.

Figures 1 through 11 depict the actual and planned distribution of program authority, research and development, and procurement and production, by ABMA. For reasons of security, I will be unable to present at this public hearing, the total approved dollars by individual program.

Figure 1, total approved program authority, fiscal years 1956, 1957, and 1958

This chart represents the total program authority received by ABMA since its inception February 1, 1956. The divisions are: the Redstone program 31 percent; the Jupiter program 64 percent; the Pershing program 2 percent and the orbital vehicle program 3 percent.

FIGURE 1

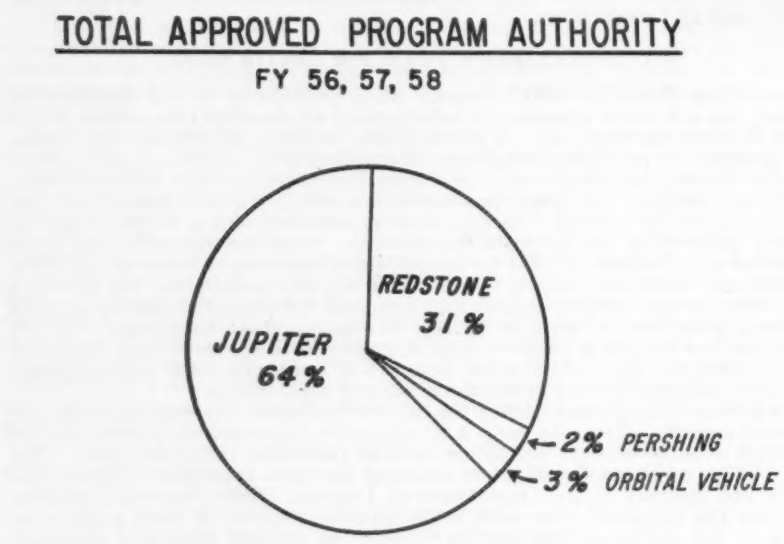


Figure 2, total planned program authority, fiscal year 1959 ABMA program

The information in this area indicates a degree of classification which can only be revealed if the committee so desires, in a closed session. (Retained in committee files.)

Figure 3, Industrial participation in Redstone program for fiscal years 1956, 1957, 1958, 1959

By this chart we see that industry has or will receive 87 percent of the total Redstone program authority for fiscal years 1956, 1957 and 1958. Other Government agencies will receive 2 percent for their internal operations support. ABMA receives for payrolls and administrative support and services 11 percent of the total program authority. On the right side of the chart we see that industry will receive 93 percent of the planned Redstone program for fiscal year 1959. Other Government agencies internal costs are estimated at 1 percent and ABMA internal operations at 6 percent. You will note that the ABMA percentage of program authority for the fiscal year 1959 planned program is lower than previous years, the reason being that ABMA will no longer engage in research and development initial prototype manufacture, since the missile has progressed to the production stage.

FIGURE 3

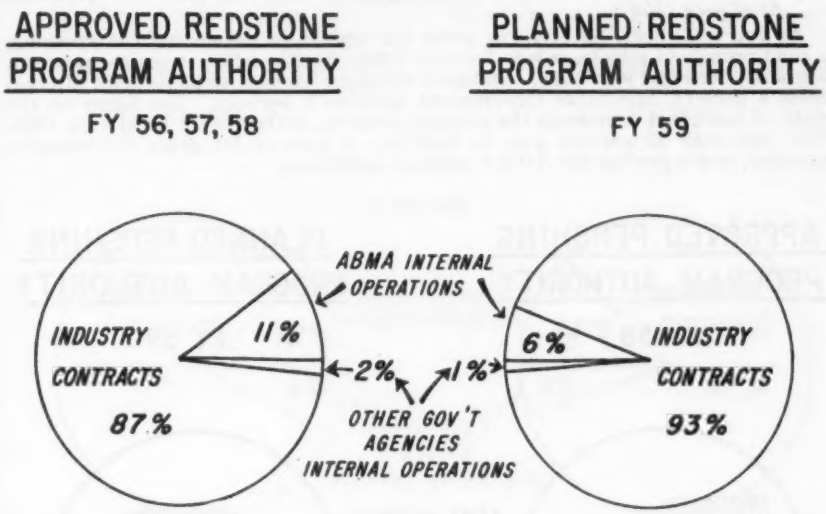


Figure 4, industrial participation in Jupiter program for fiscal year 1956, fiscal year 1957, fiscal year 1958, and fiscal year 1959

Here again, the left portion of this chart represents the approved Jupiter program authority for the fiscal years 1956, 1957, and 1958. The area representing industry contracts is 84 percent of the total program, 1 percent went to other Government agencies for their internal operations, and 15 percent was retained for ABMA internal operations. The planned Jupiter program for fiscal year 1959 is divided as follows: Industry contracts, 84 percent; other Government agencies, 1 percent; and ABMA internal operations, 15 percent. The percentage of costs for ABMA internal operations in the Jupiter program is approximately the same as the previous years.

FIGURE 4

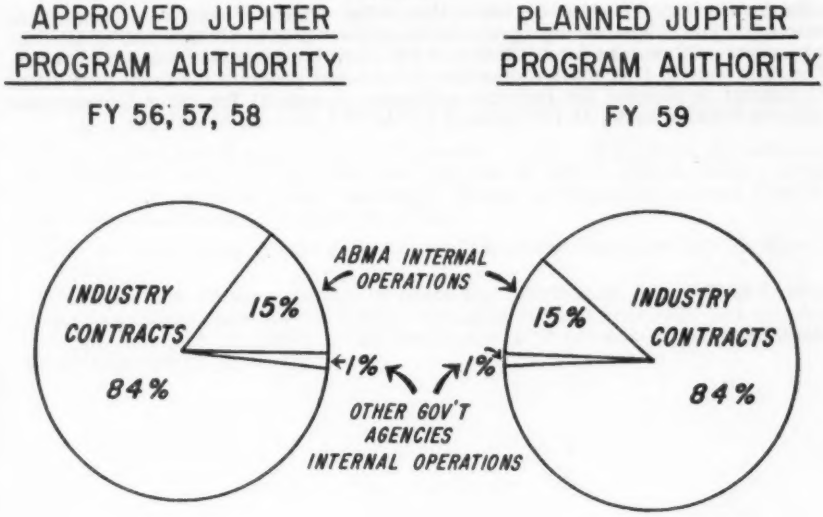


Figure 5, approved and planned Pershing program authority, fiscal year 1958 and fiscal year 1959

As you remember, ABMA was given the mission of developing the Pershing, a solid propellent missile, in late January 1958. On the left, you see the program authority for fiscal year 1958. Industry contracts amount to 95 percent, internal costs 4 percent, and other Government agencies 1 percent. The figure on the right of this chart represents the planned program authority for fiscal year 1959. You will note 93 percent goes to industry, 2 percent for other Government agencies, and 5 percent for ABMA internal operations.

FIGURE 5

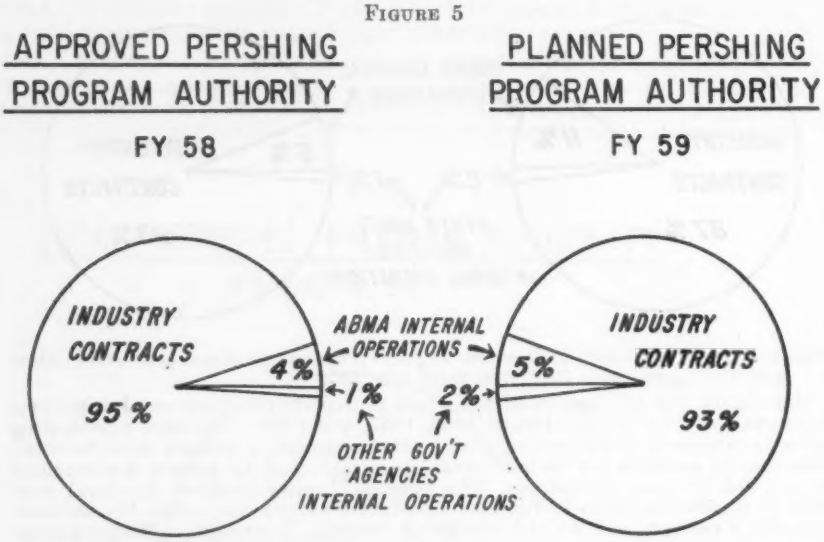
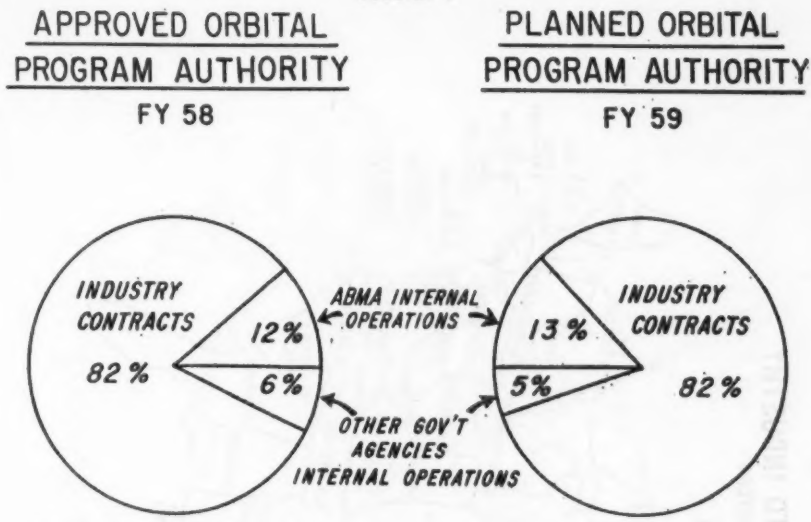


Figure 6, approved and planned orbital vehicle program authority, fiscal year 1958 and fiscal year 1959

I am sure that this chart depicting the orbital vehicle or satellite program is of interest to you. The total program for fiscal year 1958 is divided into 82 percent for industry; 12 percent for ABMA; and 6 percent for other Government agencies. The right side of this chart represents the planned program for fiscal year 1959: 82 percent is planned for industry contracts, 5 percent for other Government agencies internal costs, and 13 percent for ABMA internal operations.

FIGURE 6



(Figure 7. Classified program.)
(Figure 8. Classified program.)

Figure 9, distribution of dollars to industry by major prime contractors fiscal year 1956, fiscal year 1957 and fiscal year 1958

Here we include statistical data on small business participation in our ABMA missile programs. We show that portion of the program dollars which has gone to our major missile prime contractors, namely, Chrysler Corp., Ford Instrument Co. and North American Aviation. Subcontract percentages include all first tier subcontracts for each of the above contractors plus the first tier subcontractors of Ford Instrument Co. and North American Aviation, under their subcontract with Chrysler Corp.

Small business subcontractors have or will receive 19 percent of the total dollars, or 37 percent of the dollars subcontracted by the primes. The prime contractors will retain for manufacture, assembly and checkout 49 percent of the total amount received by their companies from ABMA. (For figure 9 see chart reproduced on p. 205.)

Figure 10, distribution of total dollars to industry fiscal year 1956 through March 1, 1958

The distribution of total dollars to industry is reflected by State on this chart. It is significant to note that of the total amount of $520.3 million, $124.4 million or 23.9 percent went to small business for the period beginning in fiscal year 1956 and extending through February 28, 1958.

Figure 11, distribution of total dollars to small business fiscal year 1956 to March 1, 1958

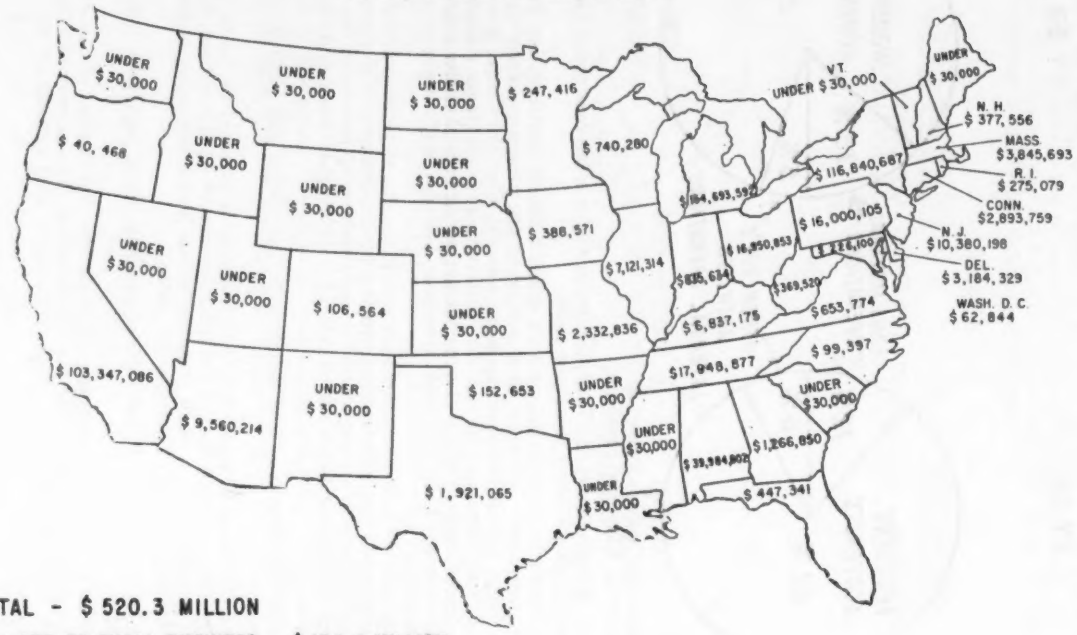
By this chart we see depicted by State the distribution of the $124.4 million going to small business for the period beginning in fiscal year 1956 and extending through February 28, 1958. This constitutes 23.9 percent of the total dollars going to industry.

FIGURE 10

DISTRIBUTION OF TOTAL DOLLARS TO INDUSTRY

INCLUDING 1ST & 2ND TIER SUBCONTRACTORS

FY 56, 57 AND TO 1 MARCH 1958



TOTAL - $ 520.3 MILLION

DOLLARS TO SMALL BUSINESS - $ 124.4 MILLION

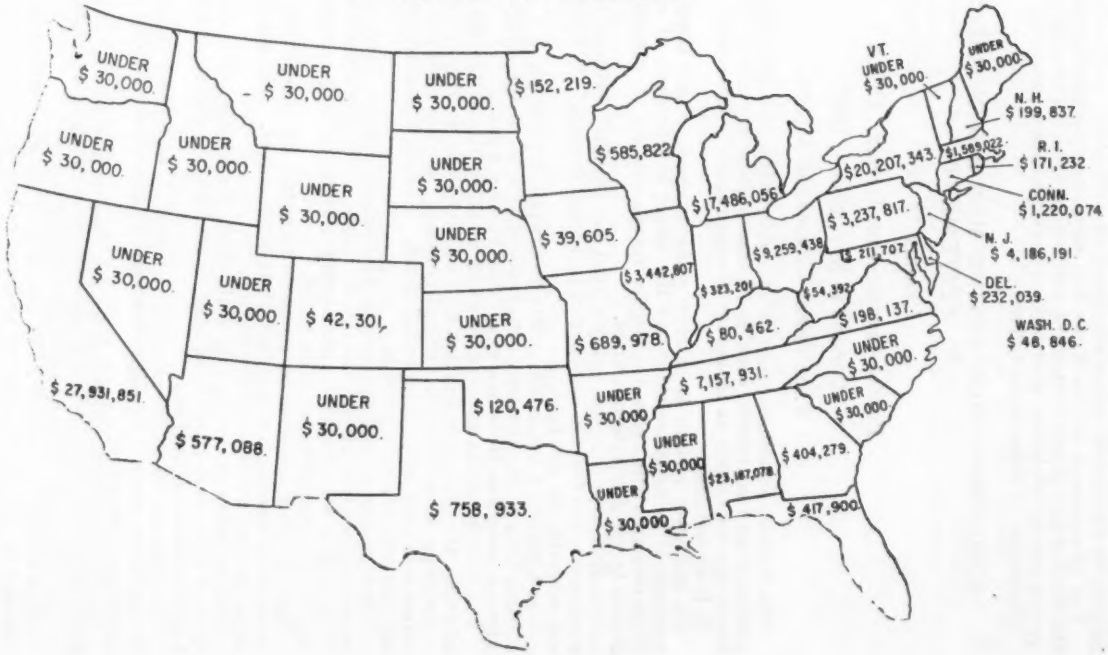
PER CENT TO SMALL BUSINESS - 23.9 %

FIGURE 11

DISTRIBUTION OF DOLLARS TO SMALL BUSINESS

INCLUDING 1ST & 2ND TIER SUBCONTRACTORS

FY 56, 57 AND TO 1 MARCH 1958



Mr. Chairman, I have discussed with you the topics contained in your letter to the Secretary of Defense, as relates to AOMC as a whole, and to ABMA in particular, in addition to attempting to give you a picture of how the Army Ordnance Missile Command has organized to accomplish its tasks. I shall be pleased to answer any questions you desire to ask me.

I would now like to call on General Shinkle to provide you with information relative to the missile projects assigned to ARGMA.

The Department of the Army has consistently issued public information in the form of fact sheets so that the public is informed of the activities of the Army guided missile, rocketry, and outer-space-exploration programs.

(Examples of these are as follows:)

EXHIBITS ACCOMPANYING MAJOR GENERAL MEDARIS' STATEMENT

Exhibit 16 (a)

Public Information Office, ABMA

Current at November 1, 1957

Fact Sheet—Redstone Missile

The Redstone medium-range ballistic missile is a high accuracy, liquid propelled, surface-to-surface missile capable of transporting nuclear or conventional warheads against targets at ranges up to approximately 200 miles.

It is 62 feet long.

Its guidance system is entirely self-contained. Once launched it follows a preplanned ballistic trajectory to the target independent of outside influences. This characteristic, plus its terrific speed, renders it completely immune to known types of countermeasures.

The Redstone fills the Army's need for mobility because missile, launching equipment, and fuel are transported in a truck convoy. A 90-foot crane assists in the assembly in the field.

The Chrysler Corp. is the prime production contractor.

Maj. Gen. J. B. Medaris, commanding general of the Army Ballistic Missile Agency, describes Redstone as a "true Sunday punch."

The missile will be handled by Field Artillery Missile Groups (heavy), the first of which, the 40th, is in training at the Army Ballistic Missile Agency.

Redstone is launched in vertical position. It rises slowly at first, then accelerates to several times the speed of sound. As it rises, controls cause the missile to tilt and head toward the target.

When necessary velocity has been attained, outside earth's atmosphere, the rocket engine shuts off and the missile coasts. The powerplant, comprising about 75 percent of the missile's length, separates from the body containing the guidance control and warhead soon after cutoff.

Both sections continue on the same path but the power unit slows more as it reenters the atmosphere and falls short of the target. The missile body continues along the trajectory to its destination.

During assembly and fueling in the field, the missile and launching area will be covered with protective fog supplied by fire-fighting apparatus because of the combustible nature of the fuel.

The crew mates the powerplant and body in horizontal position with the help of the 25-ton crane. Preflight checkout confirms the readiness of the missile for fueling and launching.

The missile's flight program is fed into its program device. Signals played back from the device activate the guidance system in flight, controlling it so that the missile follows the precomputed path to the target.

After checkout, the missile is hauled into upright position and placed on the launcher by the crane. Alcohol used as fuel and liquid oxygen used as the oxidizer are pumped into big tanks making up the center section. Hydrogen peroxide is also pumped aboard to generate steam which drives some internal equipment.

The missile is leveled and turned on the launcher so that the stabilized platform, which is the heart of the guidance system, is oriented accurately in the direction of the target.

A field firing panel is set up in a nearby foxhole.

The fire control and test truck monitors the missile throughout the fueling and until about 5 minutes prior to launch.

Because liquid oxygen boils at minus 183° C. the rate of evaporation is high at ambient temperatures. What is lost by evaporation must be replaced continuously until just before launching so that sufficient liquid oxygen is in the tank at takeoff.

Fueling ceases as launching time nears. All equipment is removed except the missile on its launcher and the firing panel in the foxhole.

After final verifications are made, the firing platoon leader closes the switch which initiates the flow of fuel and ignites it in the engine.

The full effort of the Ordnance Corps was thrown into perfecting Redstone. It will soon take its place in the Army's arsenal of operational weapons.

Redstone was the forerunner and contributor of an even more potent weapon, the Jupiter, now under development at the Army Ballistic Missile Agency. Jupiter is the intermediate range ballistic missile. Army Secretary Wilber M. Brucker has disclosed that it will have a range of approximately 1,500 miles.

Redstone was developed by the Army team of scientists and technicians headed by Dr. Wernher von Braun.

EXHIBIT 16 (b)

PUBLIC INFORMATION OFFICE

ARMY BALLISTIC MISSILE AGENCY

Redstone Arsenal, Ala.

Current at February 1, 1958

FACT SHEET—JUPITER MISSILE

The Jupiter intermediate-range ballistic missile is to date the largest weapon for which the Army has development responsibility. Being developed by the Army Ballistic Missile Agency, the missile has a range of 1,500 nautical miles. It has been test fired successfully many times.

Development of the Jupiter was the primary responsibility of ABMA when the Agency was established in February 1956. In November of that year, the Secretary of Defense issued a roles and missions memorandum which assigned the operational control of the Jupiter to the Air Force. Air Force personnel are now in training at the Agency to handle the weapon in the field.

The Chrysler Corp. of Detroit, Mich. has been granted a contract to manufacture the Jupiter. The missile is also being produced in the fabrication shops of the Missile Agency at Huntsville.

The Secretary of Defense has announced that the Jupiter, a mobile weapon designed for field use, will be employed by United States forces by December 1958.

EXHIBIT 16 (c)

PUBLIC INFORMATION OFFICE

ARMY BALLISTIC MISSILE AGENCY

Huntsville, Ala.

FACT SHEET—JUPITER-C

The Jupiter-C is a four-stage Army test vehicle developed for conducting nose cone reentry experiments. The liquid propelled main stage is a modified Redstone ballistic missile with fuel tanks elongated for greater capacity. The second, third, and fourth stages are solid propellent units composed of a number of scaled-down Sergeant motors.

In September 1956, the Jupiter–C in its first test launching was fired more than 3,000 miles. It was launched several times later and completely fulfilled its mission in the Jupiter IRBM development program, the nose cone tests being entirely successful. It was a Jupiter-C nose cone that the President displayed in announcing that the United States had successfully solved the reentry heating problem.

A modified Jupiter-C was used by the Army to launch the free world's first scientific earth satellite, "Explorer I," and subsequent orbital vehicles. The modification required for these projects was performed by the organizations that

developed the missile, the Army Ballistic Missile Agency and the Jet Propulsion Laboratory. The Agency was responsible for the main stage, which includes the intricate and highly accurate guidance and control system, while JPL provided the high-speed upper assembly and the satellite itself.

For its satellite missions the Jupiter-C employs a unique high energy fuel, Hydyne, for increased thrust and range. Liquid oxygen is the oxidizer for both Hydyne and normal Redstone missile fuels. Dimensions of the rocket and satellite launching procedure follow:

The entire length of the Jupiter-C (all 4 stages)is 823 inches. The main stage is 673 inches long and 70 inches in diameter. The high-speed upper assembly, composed of the top 3 stages and the satellite, is 150 inches in length.

The Jupiter-C is launched in a vertical position. It rises slowly at first, then accelerates to several times the speed of sound. As it rises, controls cause the missile to tilt into the trajectory. During the latter stages of ascent, the main powerplant is expended. It separates and falls back to the earth. The upper stages shortly afterward reach the apex of the arc. When the vehicle attains its maximum height, the second stage is fired.

The nose cone of the main stage rocket, then completely detached from the upper stages, continues its normal trajectory to the earth's surface, just as it would if it were a military weapon carrying a warhead.

The first stage of the Jupiter-C carries the payload (satellite) to its perigee distance from the earth. All other stages of the rocket increase the speed to the 18,000 miles per hour necessary for orbiting. The upper stages are spin stabilized, in much the manner of a rifle bullet. This is done by electric motors mounted within the nose section of the main stage. The upper assembly begins rotating while the missile is still on the launching pad, and in flight reaches a speed of more than 700 revolutions per minute.

Major industrial fabricators and supplies that contribute to the Jupiter-C program include the Chrysler Corp., Ford Instrument Co., Reynolds Metals Co., and the Rocketdyne division of North American Aviation.

EXHIBIT 16 (d)

PUBLIC INFORMATION OFFICE

ARMY BALLISTIC MISSILE AGENCY

Redstone Arsenal, Ala.

FACT SHEET ON ARMY SATELLITE PROJECT

Weight of satellite proper, 18.13 pounds.
Weight of final stage, 12.67 pounds (after burnout).
Total weight orbiting, 30.80 pounds.

The Army satellite Explorer was launched by direction of the Department of Defense as a part of America's contribution to the International Geophysical Year scientific research program. Within the Army, the project was undertaken jointly by the Army Ballistic Missile Agency and the Jet Propulsion Laboratory. The satellite was launched by the modified Jupiter-C missile, which is an Army vehicle developed for nose cone reentry tests.

Instrumentation and telemetry in the satellite is gathering and transmitting four types of information. These are: skin temperature (i. e., surface of the projectile), internal temperature, cosmic dust erosion, and cosmic ray data. The main part of the package is a cosmic radiation experiment designed by Dr. James A. Van Allen of the State University of Iowa. The major element of this experiment is a Geiger counter.

The data gathered by the instruments is continuously dispatched by two transmitters.

The most powerful transmitter operates on 108.03 megacycles, transmitting with 60 milliwatts, or six hundredths of a watt. This signal can be readily received by ham radio operators. It is expected that this transmitter, the more powerful one, will operate for a period of 2 to 3 weeks.

Second of the transmitters is operating on 108.00 megacycles, with 10 milliwatts or one one-hundredth of a watt of power. Amateur radio operators will not receive this signal. Lifetime of this one is predicted at 2 to 3 months.

It is unlikely that the Army satellite will be visible to the naked eye, except under very rare conditions, Army scientists predict. It will appear in its orbit

about the size of a fifth to sixth magnitude star, and a star of this size can hardly be seen without some magnification.

The final stage of the vehicle was not separated fron the satellite. The two are orbiting together. They will not be recovered.

Some facts on the carrier vehicle and the launching method:

The first stage of the modified Jupiter-C is a liquid propellant missile. The entire length of the composite missile (all stages) is 823.3 inches. The main stage is 672.8 inches long, and 70 inches in diameter. The high speed assembly which was launched from the first stage, plus the final stage and orbiting satellite, was 150.5 inches in length.

During the latter stages of the ascent, the main powerplant was expended It separated and fell back to the earth. The upper stages shortly afterward reached the apex of the arc. When the vehicle attained its maximum height, the second stage was fired.

The nose section of the main stage missile, then completely detached from the upper stages, continued its normal trajectory to the earth's surface, just as it would if it were a military weapon carrying a warhead.

The first stage of the missile carried the payload (satellite) to its perigee distance from the earth. All other stages of the missile increased the speed for orbiting, but did not send the satellite to a greater height. The upper stages were spin-stabilized, in much the manner of a rifle bullet. This was done by electric motors mounted within the nose section of the main stage.

The upper stages were solid propellant systems. The final stage motor and the satellite were not separated. They are orbiting together. They have a total length of approximately 80 inches, and weigh 30.80 pounds.

The orbiting portion is made up as follows:

Final stage, 46 inches long and 12.67 pounds in weight (after burnout).

Satellite instrument section, 34 inches long and 18.13 pounds in weight.

EXHIBIT 16 (e)

PUBLIC INFORMATION OFFICE

ARMY BALLISTIC MISSILE AGENCY

Huntsville, Ala.

FACT SHEET ON ARMY SATELLITE EXPLORER III

The United States Army's second scientific earth satellite, Explorer III, was launched by direction of the Department of Defense as a part of America's contribution to the International Geophysical Year research program, which is sponsored in this country by the National Academy of Sciences.

Following are measurements of Explorer III:

Weight of satellite proper, 18.33 pounds.
Weight of final stage, 12.67 pounds (after burnout).
Length of satellite proper, 34.0 inches.
Length of final stage motor, 46 inches.
Diameter of satellite and final stage, 6 inches.
Total weight orbiting, 31.0 pounds.
Total length of orbiting portion, 30 inches.

Launching of the satellite within the Army was a joint project of the Army Ballistic Missile Agency and the Jet Propulsion Laboratory. The next satellite, like Explorer I, was launched by a modified Jupiter-C missile. This vehicle was designed by the Army for use in nose cone reentry tests conducted in connection with the Jupiter IRBM development program. It is basically the Army's highly successful Redstone ballistic missile, which predated the ABMA organization and was designed by the Von Braun team under direction of Maj. Gen. H. N. Toftoy, a top missile pioneer.

Explorer III is gathering and transmitting three types of information: temperature, cosmic dust erosion, and the intensity of cosmic radiation. The main part of the instrument package is the cosmic ray experiment, which was designed by Dr. James A. Van Allen of the State University of Iowa.

There were essentially no differences in the carrier vehicle or the launching methods of the satellites. There were, however, several significant changes in the instrumentation of the new satellite.

A major change in the satellite itself was the addition of a miniature tape recorder, developed by the State University of Iowa. This device is collecting and "freezing" on tape the data on cosmic radiation encountered during the total orbit. This information is played back upon a signal given from a ground station. The tape is then automatically erased and reset.

Scientists consider information gained from this memory system a marked improvement over that of Explorer I. The first satellite dispatched data continuously; it was received only in areas of the orbital band that had ground stations. Many "blanks" occur in Explorer I's record, particularly when the satellite was over large bodies of water. The new satellite, however, is sending out cosmic radiation information representative of the total orbit. Thus, there is being conducted, for the first time, a comprehensive survey of total cosmic ray intensity above the earth with respect to both time and position.

The addition of the tape recorder necessitated a change in the operation of the radio transmitters. In Explorer I, both transmitters operated continuously. Explorer III's lower power transmitter is likewise functioning continuously. But the other transmitter is passing on the data gathered by the tape recorder, and only operates a few seconds during each orbit—whenever the playback signal is given from a ground station. A small radio receiver was added to receive the playback command.

The higher power AM transmitter radiates approximately 60 milliwatts of power and broadcasts at a frequency of 108.03 megacycles. It is transmitting only cosmic radiation information.

The low power FM beacon, with 10 milliwatts of power on a frequency of 108.00 megacycles, is also transmitting cosmic ray data on one channel. Its other three channels are devoted to internal and external temperatures, and micrometorite erosion.

It is expected that the lifetime of Explorer III's battery-powered transmitters will be about 2 months.

Minor changes were made in the temperature and micrometeorite experiments. The number of temperature sensors was reduced from 4 to 2, one each giving external and internal readings. In the measurement of meteoric particles, an impact microphone carried in Explorer I was eliminated in the second flight. However, Explorer III, like the earlier one, carries an erosion gage on the exterior of the instrument section.

The orbit of Explorer III was expected to be similar to that of the first satellite. Perigee and apogee altitudes of Explorer I were 219 and 1,587 miles respectively. Explorer III altitudes could be altered by final velocity and altitude variations. Orbital period was forecast as about 110 minutes.

The new satellite was launched at a 35° inclination to the equator, to obrit approximately between the 35th latitudes north and south.

Some facts on the carrier vehicle and the launching method:

The first stage of the modified Jupiter-C is a liquid propellant missile. The entire length of the composite missile used for launching Explorer III was 823 inches. The main stage is 673 inches long, and 70 inches in diameter. The high speed assembly which was launched from the first stage, plus the final stage and orbiting satellite, was 150 inches in length.

During the latter stages of the ascent, the main powerplant was expended. It separated and fell back to the earth. The upper stages shortly afterward reached the apex of the arc. Just prior to the time when the vehicle attained its maximum height, the second stage was fired.

The nose section of the main stage missile, then completely detached from the upper stages, continued its normal trajectory to the earth's surface, just as it would if it were a military weapon carrying a warhead.

The first stage of the missile carried the payload to its perigee distance from the earth. Other stages of the missile increased the satellite's speed to that necessary for orbiting, a minimum of 18,000 miles per hour. The upper stages were spin-stabilized, in much the manner of a rifle bullet. This was done by electric motors mounted within the nose section of the main stage.

The upper stages were solid propellant systems. The final stage motor and the satellite were not separated. They are orbiting together. They have a total length of approximating 80 inches, and weight 31.0 pounds.

EXHIBIT 16 (f)

PUBLIC INFORMATION OFFICE

ARMY BALLISTIC MISSILE AGENCY

Redstone Arsenal, Ala.

UNITED STATES EARTH SATELLITE TO PROVIDE BROAD SCIENTIFIC DATA

HUNTSVILLE, ALA.—The United States scientific earth satellite launched by the Army from Cape Canaveral, Fla., January 31 is providing basic scientific data of great value in man's efforts to understand the earth and its environment, according to Maj. Gen. J. B. Medaris, commanding the Army Ballistic Missile Agency.

The satellite launching was assigned to the Army by the Department of Defense November 8, 1957. It is a joint undertaking of the Army Ballistic Missile Agency and the Jet Propulsion Laboratory of California Institute of Technology.

Dr. Wernher von Braun, Chief of Development Operations in the Missile Agency, and Dr. William H. Pickering, Director of JPL, supervised the preparation of the multistage rocket and the satellite. The project is part of the United States contribution to the International Geophysical Year.

The Missile Agency was responsible for operation and launching of the booster, or first stage, and guidance system. The first stage consisted of a modified Redstone Ballistic Missile, a thoroughly tested vehicle now in production for field deployment.

JPL assembled the high-speed upper stages, which have solid propellant motors, prepared some of the instrumentation for the satellite, packaged the satellite and will conduct the task of gathering scientific data from the orbiting payload.

The State University of Iowa, represented by Dr. James A. Van Allen, furnished instrumentation to collect cosmic ray measurements.

The launching vehicle was redesigned from the Jupiter-C reentry test vehicle developed by the Missile Agency and JPL.

Telemetered information from the satellite, which is 80 inches long and weighs about 30.80 pounds in its cylindrical shell casing, was being received even before it left the launching pad at the missile test center.

Two miniaturized radio transmitters in the forward part of the satellite provide much scientific information which will add to man's knowledge of the earth and its environment, Dr. Pickering reported. It will also help to improve further satellite designs.

The total electronic payload weighs 11 pounds. Total payload weight, including structure and antennae, is 18.13 pounds. Total weight of the orbiting satellite is 30.8 pounds.

Each of the two transmitters telemeters information to ground stations located around the world.

The first transmitter is sending data on the skin temperature of the rear area of the satellite, internal temperature, micrometeorite impact, and cosmic ray counts.

The low power transmitter sends information on the skin temperature of the satellite forward area, the nose cone temperature, micrometeorite impact, and cosmic ray counts.

Information on the low power frequency will be received on 108 megacycles, while the high power transmitter broadcasts on 108.03 megacycles. The low power transmitter is expected to transmit data for 2 to 3 months; the high power transmitter for 2 weeks.

Both transmitters are independent, from batteries to antenna, to insure reliability in the event of accident or malfunction of an essential part.

All of the instrumentation including the sensing devices was designed and installed in such manner as to withstand the tremendous shock and vibration that occurred during the powered phase of the launch. It is estimated this was equivalent to a force of 100 gravities.

During the power phase of the launch, a temperature sensing instrument inside the nose cone tip telemetered information to ground stations on the aerodynamic heating of the nose cone. This information came in via the low power transmitter.

"This temperature," said Dr. Pickering, "is difficult to determine analytically but the range of heating is extremely important to provide launch design information for future satellites or space vehicles."

"The exterior shell and internal temperatures are instrumented to provide data on primary environment and effectiveness of head insulation techniques," Dr. Pickering said. "These data will be compared with calculated shell temperatures and experimentally determined internal temperatures to improve satellite design."

The satellite is at nature's mercy outside the earth's atmosphere. When it is on the dark side of the earth, it radiates heat to the coldness of empty space When it is on the sun side of earth, it absorbs heat at a high rate. As a result, the temperature of the satellite can fluctuate widely.

JPL scientists tried to control this wide temperature range to some degree by coating the instrumentation section and the nose cone with stripes of aluminum oxide.

The forward section of the satellite is partially covered by eight equally spaced stripes of aluminum oxide and each is one-quarter inch in width. The striping is expected to keep the temperature range within a reasonable figure to protect the sensitive electronic components carried on board the satellite.

Calculations by Dr. Van Allen indicated the external skin temperature might range from 70° below zero Fahrenheit to 100° above. The insulation was expected to reduce these limits inside the satellite to approximately 40° and 70°.

Sensors for these temperatures are located in the following places: internal temperature of instrument section, at the aft end of the high-power transmitter; skin temperature No. 1, at the fiberglass ring between the instrument section and the final stage motor; skin temperature No. 2, at the fiberglass ring between the instrument section and the nose cone.

The other telemetered data includes cosmic ray counts of heavy primary cosmic rays as they occur above the earth's atmosphere, and information on the distribution, density, and relative momentum of micrometeorites in space.

In addition to collecting information on the rate and density of tiny particulate bits of meteors in space, the satellite is equipped to detect the abrasive effect of dustlike clouds of micrometeorite particles which have a sand blast effect. For this dual task the satellite carries two sets of instrumentation.

An erosion gage is located near the aft end of the final stage motor. It contains a wire grid made up of 12 wires arranged in parallel.

If the satellite runs into a sand blasting cloud of micrometeorite matter, the wire grid will undergo erosion from the abrasive effect to the wires may be cut. As each grid is severed, there will be a small increase in frequency in the low power transmitter, indicating a micrometeorite 5 microns in size or larger.

In addition to the wire grid, the satellite carries an impact microphone with amplifier and scaler. The microphone is in spring contact with the outer shell of the satellite. When a particle of sufficient size and momentum impacts against the shell, the amplified pulse will actuate the scaler.

The output of this scaler controls the frequency of one telemeter channel of the minitrack transmitter so that when the frequency changes from low to high in the band, it will mean the satellite encountered a large particle.

When the frequency changes from high to low, the satellite will have encountered a large or small particle. Analysis of relative times in the high and low states will indicate the relative size distribution of the micrometeorites. Estimate of the absolute size and momentum of the particles will be made by calibrations selected prior to the launching.

This experiment is being performed in cooperation with the Air Force Cambridge Research Center.

The continuous cosmic ray count will be measured and telemetered simultaneously by both transmitters. Total count of cosmic rays hitting the satellite Geiger-Mueller tube has been scaled down to 32 so that each unit of 32 cosmic rays will cause a step change in frequency in the instrumentation.

The average counting rate expected will produce approximately 32 pulses per second which will cause a frequency change once each second. On this basis, the system is capable of transmitting cosmic ray information at 40 times the normal rate if such activity comes during intense solar or magnetic storms.

In addition to information received directly from the satellite through its instruments, the vehicle also will provide basic scientific information simply by being in orbit.

Ground observations of the satellite will provide information about the ionosphere, geomagnetic field intensity, and atmospheric density—information that until now was arrived at by calculations based upon indirect evidence.

Accurate optical and radio observation of changes in the satellite orbit may provide basic information as to gravitational anomalies in the earth. The exact

amount to which the earth's shape deviates from an ideal sphere can be determined from such observations.

Additionally, worldwide maps may be changed from observations made of the satellite. Geologists have long desired some precise method of accurately measuring distances between continents.

It has not been possible to stretch a tape measure between great land masses, so distances have been computed by triangulation and other methods which are not quite accurate; possible errors may be as large as about half a mile.

Geologists believe that continents drift a few feet a year but up until now there has been no method to establish this as fact. Observations made of the satellite from two stations simultaneously can lead to a precise calculation of distances between continents.

EXHIBIT 16 (g)

PUBLIC INFORMATION OFFICE

ARMY BALLISTIC MISSILE AGENCY

Redstone Arsenal, Ala.

SCIENTIFIC MISSIONS OF UNITED STATES EARTH SATELLITE

HUNTSVILLE, ALA.—The earth satellite launched by the Army's modified Jupiter-C has as its primary scientific mission the monitoring, measurement and observation of cosmic ray intensity above the atmosphere with respect to time and position.

There are secondary instruments which provide data on the density of micrometeorites, and the temperature inside and outside the satellite.

The satellite launching program, assigned to the Army as a part of the United States effort in the International Geophysical Year, is a joint project of the Army Ballistic Missile Agency, Huntsville, Ala., and the Jet Propulsion Laboratory, Pasadena, Calif. There will be an unannounced number of Army firings using the modified Jupiter-C, which was originally a reentry test missile.

The cosmic radiation experiment was designed by Dr. James A. Van Allen and his physics students at the State University of Iowa. Dr. Van Allen is chairman of the SUI physics department.

The Iowa experiment is similar to that flown by Dr. Van Allen in hundreds of sounding rockets in the past 12 years.

It consists essentially of a single Geiger counter, the same instrument that is used for uranium prospecting and for all types of radioactivity measurement. It is a simple device, and has made a number of outstanding contributions to science since it was invented in Germany nearly 40 years ago.

The satellite Explorer sends out radio signals to receiving stations distributed over much of the equatorial band covered by the satellite. The data, however, will not be completely representative of the total orbit since some of the band will not have receiving stations. Especially is this true over large bodies of water.

The cosmic radiation apparatus furnishes information which can be used for several scientific studies, such as:

1. Determination of the effective geomagnetic field.
2. Correlations between primary cosmic ray and solar and magnetic observations.
3. The magnetic rigidity spectrum of the primary radiation.

A second experiment in the Army satellite package measures meteorite density. This experiment was prepared by the Air Force Cambridge Research Center, Geophysics Research Directorate.

The impact of, and the erosion caused by, small meteoritic particles is measured in two ways.

The first instrument is an impact microphone which will pick up the sound of actual impacts of small particles colliding with the satellite shell anywhere on its surface. This measurement gives indications of the numbers of particles within a certain momentum range.

Exterior erosion gages compose the other instrument. In a ring mounted on the outside of the shell are several coils wound with extremely fine wire, electrically connected in parallel.

If one of the grid wires is hit by a particle physically large enough to break the wire, the overall resistance of the string will change in a stepwise manner. Also included in the set of gages is one composed of a very thin film of resistive material.

The total resistance of this gage will change slowly as the material is removed by the "sandblasting" action of cosmic dust traveling at a very hi-h velocity.

A third and final type of information is temperature readings both inside and outside the shell. This experiment was prepared by the Jet Propulsion Laboratory, Pasadena, Calif. Sensors placed well into the interior of the satellite and next to the outside skin—between the exterior shell and the insulation material—provide this information.

In successive passes from the sunlit to the shady side of the earth, the outer skin of the satellite is subjected to temperatures ranging from about 100° F. to 70° below zero. Insulation is expected to reduce this cycle in the instrument package to limits of 40° to 70° F. according to calculations by Dr. Van Allen.

Total weight of the scientific instrumentation is about 11 pounds. The shell of the package is almost completely filled with the two radio transmitters and their batteries, plus the scientific experiments.

The satellite was launched to orbit at approximately 20° angle to the equator. This orbit keeps it circulating overhead in a zone between the 35th latitudes North and South. At the orbital velocity of 18,000 miles per hour, the vehicle circles the earth in about 100 minutes, or 14 to 16 times a day.

Over a sufficiently long time the satellite will come at least once within sighting distance of everyone within the orbital band, covering about 125 million square miles of the earth's surface. The casual observer will not likely be able to see it with the naked eye. Except under rare conditions, it will require low power modification.

One reason for selecting a lateral orbit around the earth was to take advantage of the earth's rotation to help launch the satellite. The rocket was launched from Cape Canaveral, Fla., toward the east over the Atlantic Ocean. The earth's eastward rotation added, by a kind of slingshot effect, to the velocity given the satellite by the rocket motors.

The launching set the stage for the nervewracking task of the first sighting of the satellite. Down-range observation of the departing rocket predicted the arrival of the satellite over a given observation point with a possible error of several minutes and hundreds of miles.

In some cases there may be some doubt that the satellite is actually in a durable orbit. The number of fully equipped optical observatories is limited. Their coverage is supplemented by amateur observers all over the world, each assigned his own area of observation.

Fortunately, location of the orbiter does not depend solely on observation. Two small radio transmitters emit steady signals. One of them can be received only by special equipment, but ham radio operators the world over can tune in on the other.

Once the satellite had been sighted and its first few orbits plotted, future passes could then be predicted with increasing accuracy.

The primary optical observations will be conducted from 12 specially equipped stations. Each of them has a 20-inch Schmidt sky camera capable of registering the image of a 15-inch object at 1,000 miles or a 3-foot object at the distance of the moon.

These cameras will take a series of exposures of each passage on strip film. On these pictures the satellite can be located within a minute or 2 of arc in the sky and within milliseconds in time. Such precision will make it possible, according to Dr. Van Allen, to locate observing stations relative to one another and to center of the earth to an accuracy of 30 to 50 feet.

A dozen of such fixes will allow geographers to connect the maps of the continents with new accuracy and will help to establish the shape of the earth.

PREPARED STATEMENT OF BRIG. GEN. J. G. SHINKLE, UNITED STATES ARMY, COMMANDING GENERAL, ARMY ROCKET AND GUIDED MISSILE AGENCY, WITH ACCOMPANYING CHARTS

Gentlemen, I wish to thank you for the opportunity afforded me by your committee to acquaint you with some of the facets of our procurement activity at the Army Rocket and Guided Missile Agency.

Initially, I will discuss in general terms the physical characteristics of the missiles and rockets for which my Agency is responsible. This information is not classified.

(*a*) *Corporal.*—The addition of the Corporal guided missile to the fast-growing list of new weapons to be used in support of ground combat operations has been revealed by the Department of the Army.

The Corporal equipped with an atomic-type warhead, is a surface guided missile capable of engaging tactical targets far beyond the range of conventional artillery or the divisional 280-millimeter gun and Honest John rocket. The weapon enables the field commander to strike a selective target in the enemy rear area and gives him far greater firing power on the battlefield.

In its flight to the target, the Corporal follows a ballistic trajectory, and visibility and weather conditions place no restrictions on its use. Traveling through space at several times the rate of speed of sound, motive power is supplied to the missile by a powerful rocket motor.

A missile, a mobile launcher, and guidance equipment are included in the essential components of the weapon system. The launcher is a comparatively simple device consisting of a light metal takeoff pedestal. A self-propelled, electrically-operated erector places the missile in firing position on the takeoff pedestal.

Under an Army Ordnance contract, California Institute of Technology, as early as 1944, began experiments in the application of rocket propulsion to artillery range missiles. Predecessors of the Corporal were named the Private, the Private First Class, and the WAC-Corporal.

(*b*) *Dart.*—The dart antitank guided missile system is the answer to a definite tactical need; namely, the need for a vehicle which can carry a warhead capable of defeating the heaviest known enemy armor and which can deliver this warhead with pinpoint accuracy. As compared with present recoilless rifles and tank guns, the Dart is designed for an increased effective range, for higher accuracy at this longer range, for greater probability of a first round hit, and for a larger warhead.

The Dart antitank missile is vehicle-launched and rocket propelled. It is unique among guided missiles in that it is designed for use by front-line troops. It is a simple system requiring a minimum of technical training to operate. Its wing and tail surfaces are each arranged in a cross-shaped configuration.

The system, which has an excellent kill probability at all ranges up to the design maximum, was developed under the supervision of Redstone Arsenal, Huntsville, Ala., and Aerophysics Development Corp. The Dart is launched from a "zero-length" light weight launcher and may be employed either from a ground position or from a variety of vehicles.

Redstone Arsenal, Huntsville, Ala., is the Army Ordnance Research and Development Center for rockets and guided missiles.

(*c*) *Sergeant.*—The Sergeant, America's first truly "second generation" surface-to-surface ballistic guided missile, is a 30-feet long solid-propellent weapon which will be the successor to the Corporal missile.

Under the technical supervision of Redstone Arsenal, Huntsville, Ala., development of the Sergeant was done for the Army by the Jet Propulsion Laboratory at California Institute of Technology, Pasadena, Calif.

The Sergeant will incorporate improvements over the Corporal's power and accuracy.

The Sergeant possesses a high degree of reliability and accuracy which has been demonstrated in a series of flight tests under all operating conditions. It can deliver a nuclear blow far behind enemy lines and its highly accurate guidance system is invulnerable to any known means of enemy countermeasures.

The Sergeant utilizes a solid-propellent rocket motor which provides better performance and storage capabilities than those provided by many other weapons systems. It employs improved propellents and materials which incorporate advanced design characteristics that meet the requirements of temperature, shock, and vibration environments to which a missile will be subjected both before and during flight.

A highly mobile weapon, the Sergeant can be quickly emplaced and fired by a very small crew under all conditions of weather and terrain. All system elements have been especially designed for portability and mobility and are transportable by standard Army vehicles. The use of solid propellent and the advanced techniques for guidance have minimized system maintenance requirements and correspondingly simplified ground handling procedures and equipment. In most tactical situations, solid-propellent motors, because they are convenient and easy to handle are particularly adaptable to field operations.

On the foundation of earlier experience with the Corporal, the Sergeant represents a completely new weapon system employing the latest technological achievements.

It will be produced by the Sperry Gyroscope Co.'s Surface Armament Division at the Sperry Utah Engineering Laboratory, Salt Lake City, Utah.

Major subcontractors in the Sergeant project include Thiokol Chemical Corp Trenton, N. J.; Bell Aircraft Corp., Buffalo, N. Y.; Minneapolis-Hon

Regulator Co., Minneapolis, Minn.; and Excelco Developments, Inc., Silver Creek, N. Y.

(*d*) *Lacrosse.*—The Lacrosse, an Army surface-to-surface artillery guided missile, has been successfully developed and is in production, the Army announced early in 1957.

The Lacrosse system consists of three basic units: the missile, which is a solid fuel rocket, a launcher mounted on a standard Army truck, and a guidance station.

Cornell Aeronautical Laboratory developed the missile. It is being produced by the Glenn L. Martin Co. In announcing the production of the weapon, the Army said the Lacrosse will enable user units to answer calls for fire in the same time as required for conventional artillery and with rapidity in the field comparable to that of 105 millimeter howitzers. It gives the field commander a versatile weapon for use as either general or close support.

The Army said that the combined work of Cornell Labs and Martin had "made possible the speedy evolution of the Lacrosse from a laboratory device to a producible weapon system at a considerable savings in cost and engineering effort."

Central direction and responsibility for development of the Lacrosse, as for numerous other Army missile systems, was carried out by Redstone Arsenal at Huntsville, Ala.

The Lacrosse is capable of delivering a variety of warheads at the direction of the combat commander with precision accuracy.

The missile is launched from a truck-mounted launcher which requires no special preparation of the launch site. The launcher can leave the launch site even before the missile impacts upon the target.

The system can be transported in standard military ground vehicles or a variety of aircraft.

The missile uses a solid-propellent motor to minimize handling problems.

The system was first proposed by the Marine Corps and later transferred to the Army for development.

(*e*) *Honest John.*—Capable of carrying both atomic and high-explosive warheads, Honest John, the project name for a long-range artillery rocket, has been added to the arsenal of Army weapons, the Department of the Army has announced. The weapon will be used tactically to provide close fire support to ground combat operations.

Honest John is a free-flight rocket as compared to guided missiles approaching accuracy of standard artillery weapons. The rocket is simple in design and simple to operate,having no electronic controls. The range is equivalent to that of medium to long-range artillery, and normal crew training and standard fire-control techniques are employed.

The weapon has considerably more battlefield mobility than conventional artillery and one high explosive round can deliver on the target the demoliton effect of hundreds of artillery shells.

The Honest John consists of a simple rocket weighing several tons and a highly mobile self-propelled launcher. The rocket's shell comprises a forward compartment which houses the warhead, a motor at the center in which the rocket propellent is fitted, and a fin assembly at the rear. The head compartment, catapult, and major parts of the Honest John Rocket such as the motor and fin assembly—are assembled at the factory or arsenal. Final assembly of the explosive's warhead and fin to the rocket are done close to the firing site.

Studies for a large-caliber artillery rocket were begun by Army Ordnance in May 1950. Shortly thereafter, Douglas Aircraft submitted proposals for a rocket based on Ordnance specifications. Initial firing tests that were completed at White Sands Proving Ground in August 1951, justified production of additional models.

(*f*) *Little John.*—Little John is a 12½-inch-diameter rocket, about 12 feet long, packing the explosive power of heavy artillery.

The rocket is being designed and developed by the Army Ordnance Corps at Redstone Arsenal, Huntsville, Ala., and is intended for use in the new Army airborne division. The weapon can be transported by helicopter.

(*g*) *Nike-Ajax.*—Nike-Ajax is the Army's first supersonic antiaircraft guided missile designed to follow and destroy the enemy target regardless of evasive action. It is the first guided-missile system to defend American cities against attack.

Nike-Ajax is the end product of 8 years of guided-missile research, development, and engineering.

The Nike-Ajax project, an integral part of the Army's guided-missile program, was initiated in 1945 when Army Ordnance asked Bell Telephone Laboratories

to undertake a study of the problems involved in the construction of a new antiaircraft system. The Army, as a result of their recommendations, promptly authorized a development contract so that the envisioned guided-missile system could be brought to a reality.

Initial firing test of Nike-Ajax missiles started in the fall of 1946. The Nike-Ajax missile and its associate equipment progressed from one development stage to another throughout the intervening years until finally it was ready for mass production.

The Nike-Ajax system consists essentially of two parts; first, an expendable missile; second, an elaborate and highly complex control system requiring approximately 1,400,000 individual parts.

The Nike-Ajax system will provide defended areas with a far greater degree of antiaircraft protection than was ever before possible with the more limited ranges and altitudes of conventional antiaircraft guns.

(*h*) *Nike-Hercules.*—An improved performance of the Nike-Ajax guided missile, recently designated the Nike-Hercules with nuclear components and many times the destructive power of the original Nike-Ajax is undergoing final testing, the Department of the Army and Western Electric Co. announced February 26, 1957.

The missile was developed under technical supervision of Redstone Arsenal.

Known as Nike-B during the development stage, Nike-Hercules is substantially finer and has a much greater range than Nike-Ajax which has guarded key cities and strategic areas of the Nation for the past 3 years. It is anticipated that the new missile will be in the hands of operational Nike batteries around the country in the very near future.

Although longer appearing and more than double the diameter of the Nike-Ajax, the Hercules will have operational maneuverability far in excess of that capable of being reached by Ajax. Its higher velocity will permit swifter interception of the most advanced types of aircraft and its increased lethality will make Nike-Hercules one of the most effective weapons in American defense areas.

Nike-Hercules ground control equipment has been designed to fire both Ajax and Hercules missiles. Both Nike-Ajax and Nike-Hercules can then be fired with the same system. The equipment changes also add to the effectiveness of the Nike-Ajax. Western Electric Co. is prime contractor for the Nike-Hercules.

Research and development studies were begun on the improved version of Nike-Ajax in 1953 by the same Army-industry team which assumed responsibility for the original Nike-Ajax missile. This included the United States Army Ordnance Corps, Bell Telephone Co. laboratories, Western Electric Co., and Douglas Aircraft Co.

The ground guidance and control equipment and missile guidance are being manufactured by the Western Electric Co. at their Burlington and Winston-Salem plants in North Carolina.

Nike-Hercules research and development missiles are currently in production at the Douglas Aircraft, Santa Monica plant and production of tactical type missiles was initiated at the Douglas operated Charlotte ordnance missile plant in January 1958. Components of the associated launching equipment, also, are the responsibility of Douglas.

Western Electric is now producing battery sets of ground equipment at the maximum planned rate. Production of this equipment was initiated approximately 1 year ago.

(*i*) *Hawk.*—The Hawk is the Army's versatile surface-to-air guided missile designed for protection against low-altitude attack.

Carrying a lethal warhead, this air defense weapon system is capable of destroying attackers flying at the lowest altitudes at ranges insuring effective protection of defended areas. It will complement the Nation's air defenses against high-level attack provided by the Army's Nike system.

Central direction and responsibility for development of the Hawk—as for numerous other Army missile systems—was carried out by Redstone Arsenal at Huntsville, Ala.

The missile, using a solid fuel engine developed by Aerojet General Corp. at Sacramento, Calif., is approximately 17 feet long and 14 inches in diameter. Raytheon Manufacturing Co. of Massachusetts is the prime contractor under Army Ordnance for the development of the entire weapon system, with Northrop Aircraft of California as the major subcontractor.

The Hawk system uses radars of unique design which are highly effective in detecting and tracking the low fliers in the blind zone of conventional radars. Its guidance system is usually successful in hunting down and destroying the attackers.

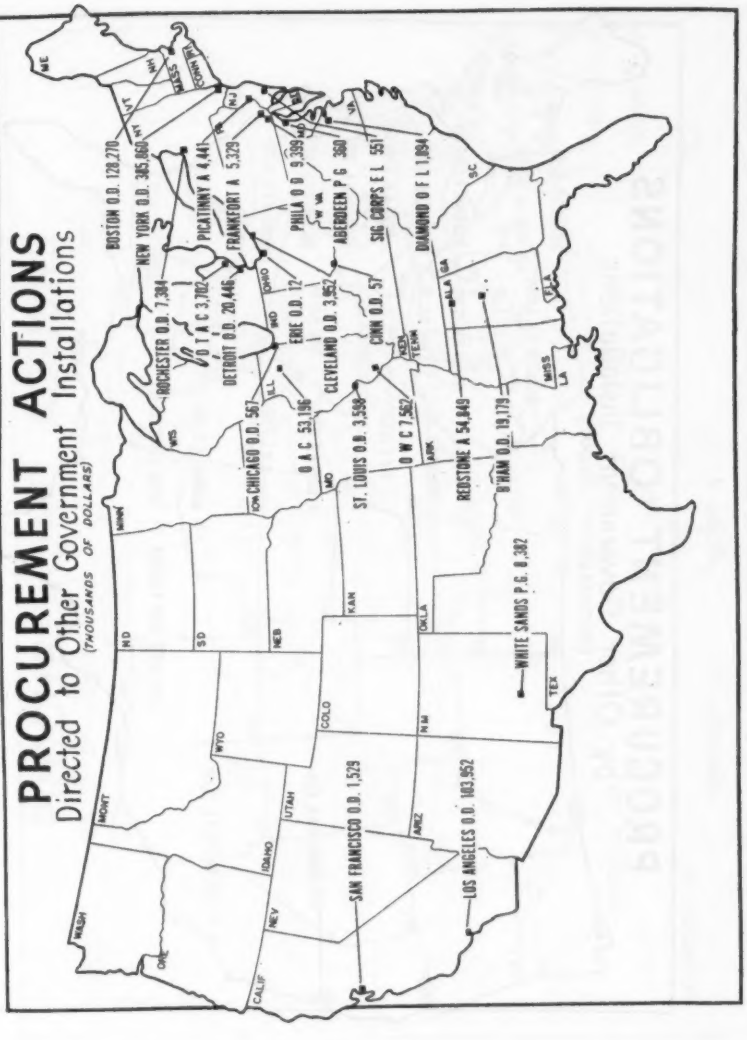
The highly mobile system is capable of being transported with a minimum number of vehicles on the highway, by helicopter, and by aircraft. By using underground storage of the missiles, only 40 acres will be required for emplacement of each battery firing the missile from fixed installations in the United States.

These missile systems are developed, engineered, and produced by industry under our direction and control. Almost without exception, all the programed dollars go out to industry both for research and development and for industrial procurement. This is one of the procurement methods described by General Medaris.

Both large and small industry participate in each of our programs. To indicate this participation, I have a series of slides based on data covering fiscal year 1957 and the first half of fiscal year 1958.

Slide No. 1 indicates the dollars directed by the Rocket and Guided Missile Agency to all other Government installations including Ordnance districts, aresenals, commodity commands, Corps of Engineers, Signal Corps and the United States Air Force.

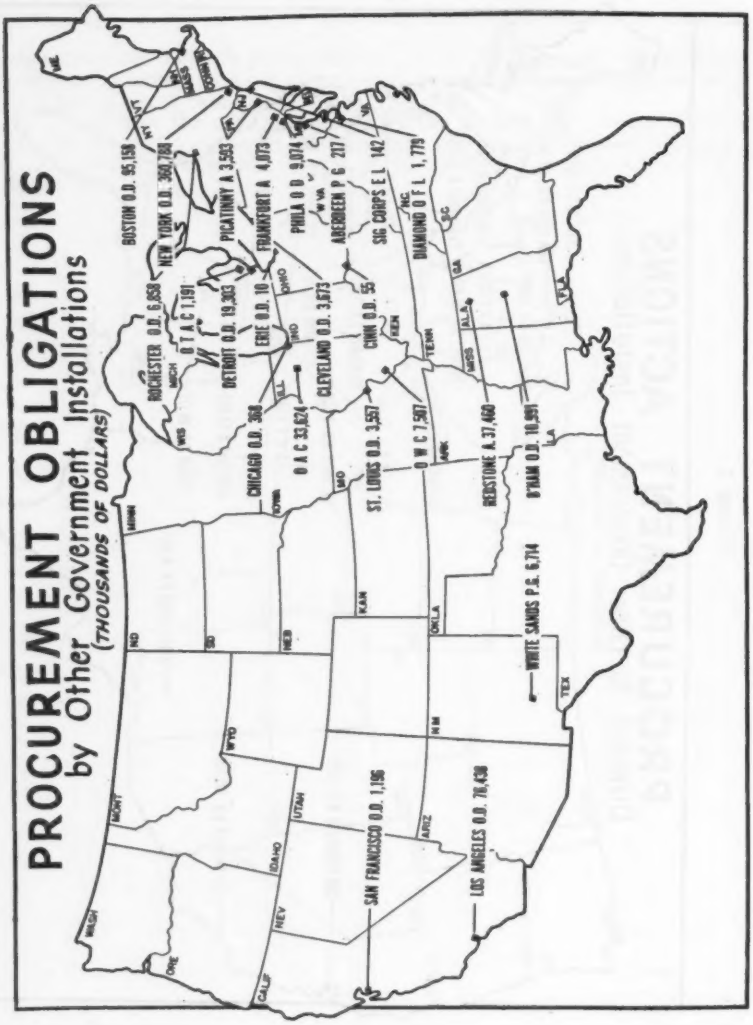
SLIDE 1



25108—58——14

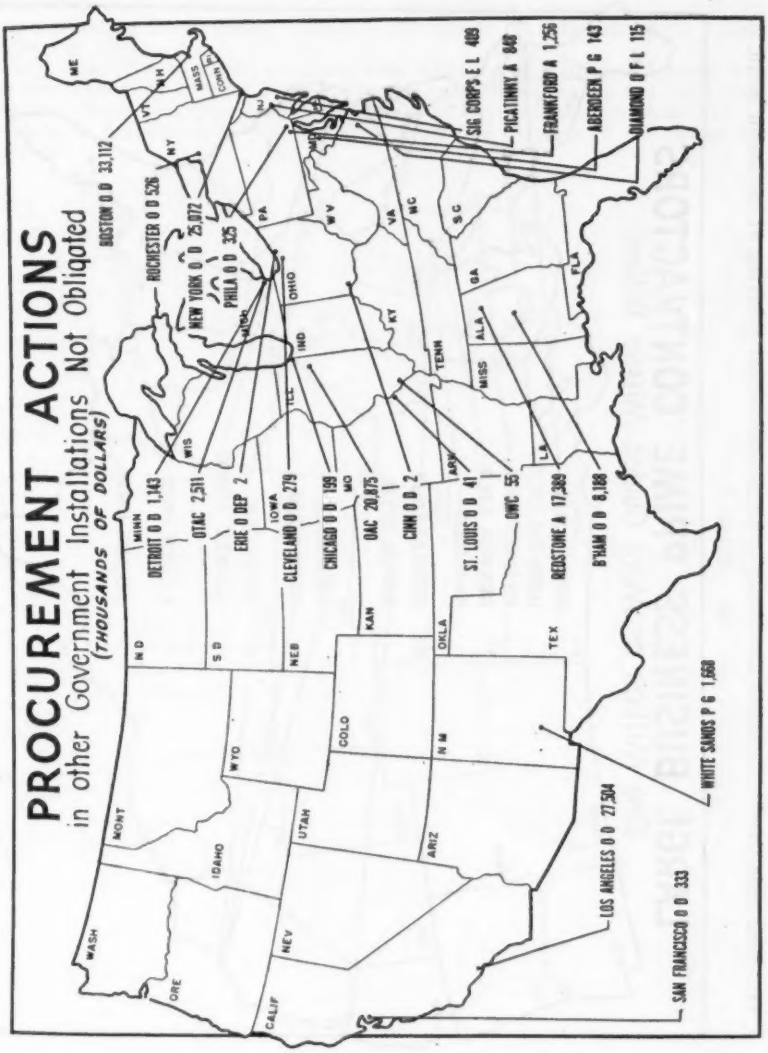
My next slide (No. 2) shows the status of dollars obligated by December 31, 1957.

SLIDE 2



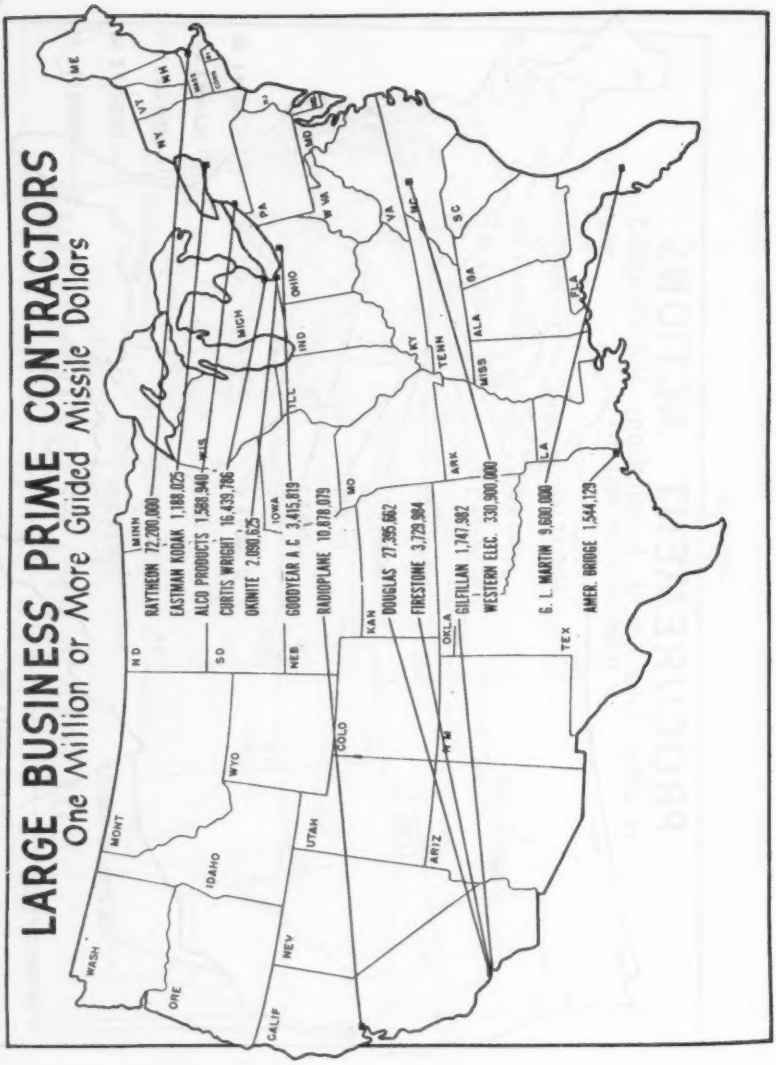
Slide No. 3 shows the unobligated balance as of this same date.

SLIDE 3



This next slide (No. 4) indicates the dollars to prime contractors receiving $1 million or more.

SLIDE 4



Slide No. 5 shows the total dollars to each State. (See p. 167 for chart).

Slide No. 6 shows what went to small business by State. (See p. 168 for chart).

This allocation of dollars to subcontractors compared to that which was not broken out but stayed with the prime contractor is shown on this slide (No. 7). You will note that the prime contractor kept 28 percent of each dollar, 48 percent went to large business, and small business received 24 percent which amounted to about $152 million.

Let me stress that for the purpose of this presentation we developed information not only pertaining to our prime contractor, but also to his subcontractor. (Slide 7, see chart p. 169).

My next slide (No. 8) shows what our local situation at Redstone Arsenal was for the first half of fiscal year 1958. These are actions taken by our local purchasing and contracting organization in support of both ABMA and ARGMA.

The data so far shown to you has dealt with the division of the dollar for procurement.

SLIDE 8

Purchasing and Contracting Division, Redstone Arsenal, July through December 1957 (local actions only)

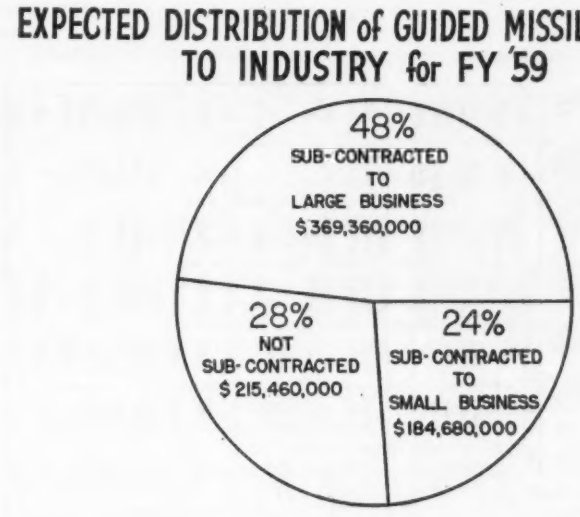
PROCUREMENT ACTIONS LESS THAN $10,000

	Total dollars	Large business		Small business		Number of actions		Percent by dollars to small business	Percent by number to small business
		Formally advertised	Negotiated	Formally advertised	Negotiated	Large business	Small business		
July	502,003	46,377	201,814	34,152	309,660	442	1,449	42	77
August	870,922	21,123	335,398	97,731	416,670	580	1,753	59	75
September	874,183	38,990	297,204	64,021	473,968	638	1,825	62	74
October	1,012,378	23,532	349,073	67,013	572,760	718	2,219	68	76
November	635,124	15,992	238,643	40,207	340,282	548	1,633	60	75
December	949,860	13,894	335,098	72,599	528,269	646	1,863	63	74
Total	4,934,470	159,908	1,757,230	375,723	2,641,609	3,572	10,742	61	75

PROCUREMENT ACTIONS IN EXCESS OF $10,000

July	2,021,867	391,941	770,030	467,894	392,002	46	51	43	53
August	861,090	73,026	657,031	None	131,033	33	19	15	37
September	1,383,547	536,877	552,597	42,587	251,486	44	30	21	41
October	1,473,362	328,769	917,400	35,023	192,170	37	29	15	44
November	1,446,330	142,523	1,115,915	58,951	128,941	42	16	13	28
December	2,824,289	81,600	2,348,897	242,775	151,017	40	26	14	39
Total	10,010,485	1,554,736	6,361,870	847,230	1,246,649	242	171	21	41

To indicate the expected distribution of the fiscal year 1959 dollars, I have a slide (No. 9) indicating the breakdown of the 770 million we expect to receive. This division has been made using the same percentage as last year, anticipating certainly no less effort by small business and most probably increased participation as our new programs become more active in the industrial phase.



SLIDE 9

You have heard from General Medaris how we select our contractors and what type of contracts are normally used, as well as the reasons therefor. I shall not repeat this since it covers just what ARGMA does.

There is one aspect of our procurement activity that I would like to touch upon.

During the procurement cycle of a missile system, requests are received from procurement agencies for a source list of potential producers having a capability to produce a particular item. This might be an item to be subcontracted by a prime contractor or one of his major subcontractors, or it might be an item suitable for advertised bidding or competitive negotiation. Source data files are maintained by ARGMA based upon information obtained by direct contact with company representatives, from company brochures and financial statements, and from plant survey by qualified personnel from my agency. This system has been very effective and has served to acquaint us with the capabilities of many small-business firms.

At this point, let me reiterate the fact that when we accelerate these missile programs as we have done and are now doing, we are compressing the time from the determination of the feasibility of a missile system to the issue of a weapon tactically acceptable to troops by accomplishing development and initial production concurrently. Since the changes to the hardware are so rapid and frequent, the preparation and maintenance of documentation suitable for advertised bidding is not possible. We are still dealing largely with ideas and concepts. It is the Army policy to consider advertising as the preferred method of procurement. In support of this policy, we advertise wherever practicable. However, because of the complexity of many of our products as well as their dissimilarity to existing commercial production, we are required to employ negotiation to a great extent.

General Medaris has discussed our breakout policy and the requirements which must be met prior to this action. Insofar as the systems assigned to my agency are concerned, and let me state here that these are generally the higher density systems, we seek to break out first from sole source procurement those items classed as repair parts. As an example, on the two guided missile systems now in the hands of troops, Nike-Ajax and Corporal, and referring to numbers of line items, 77 percent of the repair parts for Ajax and 57 percent of the repair parts for Corporal are procured by other than sole source. The percentage and dollar value in each instance will be less.

SLIDE 10

NATIONAL MISSION RESPONSIBILITIES of ARGMA

COMMODITY	NATIONAL RESEARCH & DEVELOPMENT	NATIONAL PROCUREMENT AND PRODUCTION	NATIONAL INDUSTRIAL ENGINEERING	NATIONAL INDUSTRIAL MOBILIZATION	NATIONAL SUPPLY CONTROL & STOCK CONTROL FOR COMPONENTS	NATIONAL STOCK CONTROL & SUPPLY CONTROL FOR COMPONENTS	NAT. SUPPLY & STOCK CONTROL FOR SPARE PARTS COMPONENTS	NATIONAL MAINTENANCE
PART A - MAJOR COMBINATIONS OR SYSTEMS, OR END ITEMS OF AMMUNITION								
1. GUIDED MISSILE SYSTEMS, LESS [1]	X	X	X	X	(MISMA)	(MISMA) X[2]	-	X
a. SPECIAL WEAPONS MATERIEL	X	(OAC)	(OAC)	(OAC)	(MISMA)	(OAC)	(OAC)	(OAC)
2. ROCKET SYSTEMS (ATOMIC CAPABILITY), LESS:	X	X	X	X	(MISMA)	X	-	X
a. SPECIAL WEAPONS MATERIEL	X	(OAC)	(OAC)	(OAC)	(MISMA)	(OAC)	(OAC)	(OAC)
b. LAUNCHERS	X	(OWC)	(OWC)	(OWC)	(MISMA)	(MISMA)	(OWC)	(OWC)
3. ROCKET SYSTEMS (NON-ATOMIC CAPABILITY), LESS:	X	(OAC)	(OAC)	(OAC)	(MISMA)	(OAC)	-	(OAC)
a. LAUNCHERS	X	(OWC)	(OWC)	(OWC)	(MISMA)	(MISMA)	(OWC)	(OWC)
4. AERIAL TARGET DRONES	X	X	X	X	(MISMA)	(MISMA)	(RA)	(RA)
PART B - COMPONENTS								
1. GROUND EQUIPMENT FOR GUIDED MISSILE SYTEMS EXCEPT:	X	X	X	X	(MISMA)	(MISMA)	X	X
a. COMMON VEHICLE CHASSIS	(OTAC)	(OTAC)	(OTAC)	(OTAC)	(MISMA)	(MISMA)	(OTAC)	(OTAC)
b. SPECIAL PURPOSE VEHICLES	X	(OTAC)	(OTAC)	(OTAC)	(MISMA)	(MISMA)	(OTAC)	(OTAC)
c. FIRE CONTROL COMPONENTS COMMON TO ANTI-AIRCRAFT OFF-WEAPON FIRE CONTROL SYSTEMS	(FA)	(FA)	(FA)	(FA)	(MISMA)	(MISMA)	(FA)	(FA)
2. PROPELLANTS FOR GUIDED MISSILES, ROCKETS, AND JATO'S, EXCEPT:	X	X	X	X	(MISMA)	X	-	X
1/ GUIDED MISSILE COMPLETE ROUND								
a. SOLID PROPELLANTS, EXCEPT:	X	(OAC)	(OAC)	(OAC)	-	-	-	-
(1) EXTRUDED AND CAST DOUBLE BASE	(PA)	(OAC)	(OAC)	(OAC)	-	-	-	-
3. JATO'S (LESS PROPELLANT), EXCEPT:	X	X	X	X	(MISMA)	(OAC)	-	(OAC)
a. JATO'S, FOR ORDNANCE GUIDED MISSILE SYSTEMS, USING EXTRUDED AND CAST DOUBLE BASE PROPELLANT	(PA)	X	X	X	(MISMA)	X	-	X
b. JATO'S FOR OTHER THAN ORDNANCE GUIDED MISSILE SYSTEMS, USING EXTRUDED AND CAST DOUBLE BASE PROPELLANT	(PA)	(OAC)	(OAC)	(OAC)	(MISMA)	(OAC)	-	(OAC)
4. FUZES, ALL TYPES, FOR ROCKETS (ATOMIC CAPABILITY) AND GUIDED MISSILES, EXCEPT:	X	(OAC)	(OAC)	(OAC)	(MISMA)	X	-	X
a. VT FUZES	X	X	X	X	(MISMA)	X	-	X
5. FUZES, ALL TYPES, FOR ROCKETS (W/O ATOMIC CAPABILITY)	X	(OAC)	(OAC)	(OAC)	(MISMA)	(OAC)	-	(OAC)
6. LAUNCHERS, ROCKET, EXCEPT	(OWC)	(OWC)	(OWC)	(OWC)	(MISMA)	(MISMA)	(OWC)	(OWC)
a. LAUNCHERS, ROCKET, AIR TO AIR	X	(OWC)	(OWC)	(OWC)	(MISMA)	(MISMA)	(OWC)	(OWC)
b. ON-WEAPON FIRE CONTROL	(FA)	(FA)	(FA)	(FA)	-	-	(FA)	(FA)
c. SPECIAL PURPOSE VEHICLES	X	(OTAC)	(OTAC)	(OTAC)	(MISMA)	(MISMA)	(OTAC)	(OTAC)
7. DRILL AMMUNITION FOR LAUNCHERS, ROCKET, EXCEPT:	X	X	X	X	-	-	(OWC)	(OWC)
a. DRILL AMMUNITION FOR LAUNCHERS, ROCKET (W/O ATOMIC CAPABILITY)	X	(OAC)	(OAC)	(OAC)	-	-	(OWC)	(OWC)
8. NON-ATOMIC WARHEADS FOR ROCKETS (ATOMIC CAPABILITY) AND FOR GUIDED MISSILES	(PA)	(OAC)	(OAC)	(OAC)	(MISMA)	X	-	X
9. SPECIAL WEAPONS MATERIEL LESS NUCLEAR COMPONENTS FOR ROCKETS (ATOMIC CAPABILITY) AND GUIDED MISSILES	(PA)	(OAC)	(OAC)	(OAC)	(MISMA)	(OAC)	(OAC)	(OAC)

1 - EXCEPT THE REDSTONE AND IRBM PROGRAMS
2 - GUIDED MISSILE COMPLETE ROUND
X ARGMA NATIONAL MISSION RESPONSIBILITIES

In determining items which are suitable for small-business, it is the policy to require that the small-business specialist at the command have access to all procurement actions either by himself or as a member of the purchase assignment board. In general, the following criteria is applied in determining items suitable for small business:

(*a*) A determination as to the completeness of engineering and specifications in order to insure that the product required is exactly described for manufacturing purposes.

(*b*) Whether or not small business has been competitive in previous procurement.

(*c*) Whether or not the item is of a type normally produced by small business.

(*d*) The capacity required to produce the item in order to estimate whether small business might be expected to have the working force, space, and equipment needed.

(*e*) The ability of small business to meet the time and rate of delivery.

Our next priority effort, and this may be concurrent with the first, is applied to ground support equipment. This term includes missile and ground guidance and control test equipment, and vehicles.

Test equipment for a particular missile system is so interrelated to the system itself that the closest relationship during development and production must exist We have recognized also that an across-the-board approach to the problem would be desirable from the viewpoints of cost, flexibility, and logistic support. Toward this objective we have initiated contracts to develop a standardized approach to test equipment.

This program is still well into the research and development phase.

In the case of vehicles, we seek to use standard items whenever possible. For certain applications, however, special requirements exist for which no standard vehicle exists. We work very closely with the Ordnance Tank and Automotive Command during the research and development period to maximize the application of their experience. During the industrial phase, we actually transfer the engineering and procurement responsibility to OTAC retaining only the authority to control the changes effecting compatability and system integrity. As stated by General Medaris, our missile system contracts are usually cost-plus-fixed-fee type and are governed and administered by the same policies, regulations and procedures as are applicable to any other type of procurement.

Now let me say a few words about the current status of the antimissile missile program. As we started into this effort there were posed two requirements—one for an antimissile missile system for use with the Army in the field, the other was for the defense of continental United States and fixed sites overseas. Several agencies were requested to submit feasibility studies covering each of these areas. As a result of the feasibility studies:

(*a*) A technical requirement was submitted in October 1954, to the Bell Telephone Laboratory for a proposal on the fixed installation concept. This technical requirement requested a study of a forward looking antiaircraft defense system, to be capable of defending target threats during the 1960–65 period. The contract was negotiated and was formerly included in an extension of the Nike system contract—DA 1082. This is the current Nike-Zeus antimissile missile.

(*b*) On June 27, 1955, the development of large scale motor experimental exploration was provided in a contract with Grand Central Rocket Co. The goal here was to experiment with high propulsion impulse solid propellent that could lead to the selection of a propellent for the Nike-Zeus misssile.

(*c*) On February 1, 1957, the contractor relationship with Western Electric Co. as it pertained to the Nike-Zeus program, was covered in a new contract ORD 1955.

(*d*) On November 11, 1957, the contract structure as it pertained to the relationship to the Government, Western Electric Co. and principal subcontractor, DAC and Grand Central Rocket, was changed to place Grand Central Rocket as subcontractor to DAC.

Programed effort from fiscal year 1956 through fiscal year 1958 was $49.2 million. This included $24.2 million research and development funds and $25 million procurement and production in support of research and development. This is now the current position insofar as Nike-Zeus is concerned. No production contract or engineering services contract has been finalized as of this time.

In September 1956 Sylvania Corp. was selected from four corporations submitting feasibility studies to be the research and development contractor for the mobile antimissile missile system. They have proceeded under ORD–1166 with the development of this system called Plato. The Plato system program called for the expenditure of $17.1 million from 1955 through 1958.

In conclusion, one last point with relation to engineering documentation, drawings and specifications, as it pertains to procurement of components and repair parts. Included in the details of prime system contracts are provisions for the supplying of drawings and specifications in accordance with Ordnance format. This enables us to utilize competitive procurement procedures for followup and replacement parts procurement, except for those closed-loop items on which this method is not deemed practical from a system integrity standpoint. In addition, we have insured the protection of the Government's interest by providing direction covering the control of proprietary items, patents, drawings and specifications, and reproduction.

Gentlemen, that concludes my remarks. I am very grateful to you for the opportunity afforded me to tell you what we are doing. We are proud of our record in the missile field and attribute much of our success to the fact that we have solicited and obtained outstanding contribution from small business. I shall be pleased to try to answer any questions.

Senator SPARKMAN. All right, Secretary Higgins.

Mr. HIGGINS. Mr. Chairman, we have been joined at the witness table by Brig. Gen. Jean E. Engler, who is Director of Procurement in the Office of Deputy Chief of Staff for Logistics, who will sit here as the overall representative for procurement of the United States Army. Now then, we would like to entertain your questions.

Senator SPARKMAN. Thank you very much. I would like to say that I have enjoyed the statements very much. I think you have presented a very fine and clear picture. There is one thing I take a great deal of comfort from and that is the interest that is manifested by all of our services and the work that is done toward channeling as much of this business as can reasonably be done to small business. I realize that it is not always an easy job, but we believe, and I think you gentlemen agree with us, that in order to be strong in this country, industrially strong and defensively, we must have a strong small business because after all, 90 to 95 percent of all businesses in this country are small business. I want to express my appreciation of what you gentlemen and the gentlemen in the other branches of the services have done to help us in this field of small business. I will ask Mr. Stults to ask any questions he wishes.

Mr. STULTS. I have no questions. Mr. Weadock stated before he left to take a telephone call that he had no questions. The presentations sent to us by the various generals and by Secretary Higgins did answer fully his questions.

Senator SPARKMAN. I should think this would indicate a quite satisfactory job.

Mr. HIGGINS. I would like to say, Mr. Chairman, before we close here that our response to your remarks and this committee, too, we are always urged on regardless of our own efforts, and they are daily. I want to assure you by oversight I failed to introduce our small-business visitor, Jack Askins. I know he is so well known to you folks here. Jack, I apologize for not getting you introduced earlier.

Mr. ASKINS. Thank you, sir.

Mr. HIGGINS. We are grateful for your staff people who work with us continually. We don't always agree with you but we know we are both trying to do the same thing and we always welcome their criticisms and recommendations. We in the Army have a better opportunity than our sister services to make a higher percentage showing because we buy more of the things available from small business. Today we buy for all the military through the single manager concept, all the subsistence and all the textiles. These lend themselves very

well to small business and so our percentages run higher, but I wanted to make this explanation as to why they do because we cooperate with the other services in trying to get everything we can to small business. I also want to state, with modesty as General Hinrichs mentioned, that on the 15th of May I have received an invitation from the American Management Association to address that group on small business in the Biltmore Hotel in New York City, and I am looking forward to that with a great deal of anticipation as a place to spread the word further of our honest intentions in what we are trying to do, an honest job to see that the little fellow gets his share. As Abraham Lincoln used to say, "God must have loved the poor people because he made so many of them;" I say, "He also loved the small-business people because he made quite a few of those." [Laughter.]

Senator SPARKMAN. When are you going to speak in New York, May 15?

Mr. HIGGINS. Yes, sir. May 15.

General Engler had something he would like to say.

Senator SPARKMAN. Yes, General, we are very glad to hear from you.

STATEMENT OF BRIG. GEN. JEAN E. ENGLER, DIRECTOR OF PROCUREMENT, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS, DEPARTMENT OF THE ARMY

General ENGLER. Mr. Chairman, in answer to several questions that have been sent to us, I would like to be permitted, if I may, to introduce for the record the statistics which are required in order to be responsive to those questions. The statistics concern themselves with our obligations and expenditures, the percentage of small business in the areas in which the committee has expressed interest this year, and also have to do with our procedures for the selections of sites for our missiles. If I may introduce these statistics for the record.

Senator SPARKMAN. We will be very glad to have them and they will be included in the record.

Thank you very much, General.

(The exhibits presented by General Engler follow:)

EXHIBIT 17(a)

DEPARTMENT OF THE ARMY

Missiles, rockets, and outer space exploration programs,[1] procurement of equipment and missiles, Army appropriation and research and development appropriation

[4121, 4122, and 5100 only]

	Fiscal year 1955	Fiscal year 1956	Fiscal year 1957	Fiscal year 1958	Fiscal year 1959
Army program approved by Congress:	*Millions*	*Millions*	*Millions*	*Millions*	*Millions*
Procurement of equipment and missiles, Army	$466	$400	$876	[2] $668	$626
Research and development	([3])	46	80	87	145
Total	466	446	956	755	[4] 771
Congressional fund appropriation:					
Procurement of equipment and missiles, Army [5]	30	0	0	[6] 20	
Research and development	([3])	46	80	87	
Total	30	46	80	107	
Obligations:					
Procurement of equipment and missiles, Army	318	402	702	706	
Research and development	68	108	114	128	
Total	386	510	816	[7] 834	
Expenditures:					
Procurement of equipment and missiles, Army	238	333	414	[8] 666	
Research and development	64	42	104	([9])	
Total	302	375	518	666	

[1] Army research and development directed toward space exploration is included in the missile program.
[2] Does not include the $80 million approved for Jupiter by Office of the Secretary of Defense and Bureau of the Budget from available funds.
[3] Congress reduced the budget by $10 million in fiscal year 1955. Army research and development cannot relate the reduction to this budget project (5100).
[4] As submitted to Congress, the total PEMA figure does not include the additional $130 million for Nike-Zeus which has been requested in the fiscal year 1959 budget supplement. With this additional amount the total for fiscal year 1959 PEMA program is increased to $756 million and the grand total $901 million.
[5] The Army did not request new obligational authority for these PEMA program categories since financing of the total program for any fiscal year can come from any or all of the following sources:
1. Unobligated carryover from prior years,
2. New obligational authority appropriated by Congress, and
3. Anticipated reimbursements from other customer orders.
[6] With the exception of $20 million in fiscal year 1958, no new obligational authority was appropriated by Congress to the Army for these projects.
[7] Estimate.
[8] Estimate as of Apr. 21, 1958, for entire fiscal year expenditures.
[9] No forecast of expenditures by budget subproject (5100) is available for research and development in fiscal year 1958.

Mr. Chairman, the above statistics which I have presented to you, concerning the percentage which has been awarded to small business through the 28th of February, 1958, concerns itself with the three items which you have indicated an interest—guided missiles, electronics, and construction.

In construction, we are currently ahead of our performance for the last fiscal year and in electronics, we are so close to last year's performance that I believe there is a reasonable expectation of exceeding last year's performance. In the area of guided missiles, we show a performance of 1.7 percent to small business as of the 28th of February as against 3.6 percent for the fiscal year of 1957. This has caused us some concern, however, there is a reason which would indicate that we might expect improvements in this performance during the remainder of this fiscal year. Our major item program this fiscal year got off to a late start as compared to fiscal year of 1957, and in fact the major portion of our program was not released until January of 1958.

In the execution of a program, the first order of business is to place the prime contracts which involve our longest lead time prior to production. The smaller elements which we procure separately generally have a shorter lead time and we, therefore, hold the placement of these elements until we have gotten our longest lead time items on contract. As the greater part of our small-business participation occurs in our procurement of the shorter lead time elements, I would expect that we should show improvement in this small-business percentage for guided

missiles during the latter part of this fiscal year. Our statistics for January and February do show an increase in the small-business percentage over 1.7 percent average which I showed through February 28, 1958, and this also inclines me to predict that we should better the 1.7 percent by the end of this fiscal year.

EXHIBIT 17(b)

Comparison of total procurement, procurement with small business, and percentage received by small business, fiscal year 1957 versus 1st 8 months fiscal year 1958

[Values in thousands of dollars]

	Total procurement		Procurement with small business		Percent to small business		1958	
	Fiscal year 1957	July 1, 1957–Feb. 28, 1958	Fiscal year 1957	July 1, 1957–Feb. 28, 1958	Fiscal year 1957	July 1, 1957–Feb. 28, 1958	January	February
A–2 Guided missiles	$576,342	$444,421	$21,706	$7,425	3.6	1.7	3.0	2.1
A–7 Electronics	372,147	104,899	69,029	18,215	18.5	17.4	20.9	35.5
C–2 Construction	997,999	176,920	635,370	113,790	63.7	64.3	52.8	76.6

EXHIBIT 17(c)

PROCEDURES REQUIRED IN SELECTION AND ACQUISITION OF AAA MISSILE TACTICAL SITES

1. Area to be defended and weapon is designated by CINCNORAD with the approval of the JCS and Secretary of Defense.

2. Following the designation indicated in paragraph 1, a site selection team consisting of representatives of ARADCOM, RADCOM, ZI Armies, and technical services select the sites for the missile installations in the defense area.

3. Following selection of the sites upon request from the commanding general, USARADCOM, the district engineer prepares a real estate planning report containing description of the sites, estimated land cost, problems involved in the acquisition, etc., and distributes copies to ARADCOM, RADCOM, Chief of Engineers, DCSLOG, and ZI Army commanders.

4. The real estate planning reports are reviewed and approval and/or comments of each interested agency submitted to Chief of Engineers.

5. On Approval of the real estate planning report the Chief of Engineers submits through DCSLOG to the ASA (CMA) recommendations that—

(*a*) The land acquisition project be approved by ASA (CMA).

(*b*) That a recommendation be submitted to ASD (P. and I.) for approval of the land acquisition.

6. Upon receipt of DA and DOD approval Chief of Engineers (in cases involving the total real estate cost of $25,000 or more), submits the proposal to the Armed Services Committees of the Senate and House of Representatives for agreement.

7. Chief of Engineers, upon receipt of notice that the Armed Services Committees agree to the proposed acquisition, directs the appropriate district engineer to proceed immediately with detailed appraisals, procurement of title evidence, and negotiations to acquire the land.

Senator SPARKMAN. Thank you, Mr. Secretary, and gentlemen, all of you.

This concludes the hearings. The committee stands adjourned.

(Whereupon, at 12:30 p. m. the hearing was adjourned.)

APPENDIXES

INDUSTRY LETTERS AND STATEMENTS RELATIVE TO PROCUREMENT POLICIES AND PROCEDURES GOVERNING PURCHASES OF MISSILES AND RELATED EQUIPMENT

APPENDIX 1(a)

SYSTEMS INC.,
Orlando, Fla., March 21, 1958.

Hon. GEORGE A. SMATHERS,
Chairman, Senate Small Business Committee,
Washington, D. C.

DEAR SENATOR SMATHERS: I have just learned of your proposed hearings covering the participation of smaller firms in our Government's procurement of missiles and related equipment.

Enclosed please find the observations of this company concerning the weapons system procurement technique now being utilized by the military services.

I trust that this information will be helpful to you in determining what matters you will take up with the military representatives during the public hearings.

Very truly yours,

S. M. KAPLAN, *President.*

Probably no single factor has had greater impact in the decreasing share of small business in defense procurement than current practices in weapons systems contracting. These practices which lead to a concentration of activity in a small number of large companies actually are independent of the weapons systems concept, but rather result from the particular method of carrying out such programs at the present time.

The weapons systems concept, as such, may be defined as an approach to the development of military devices (notably missiles and aircraft), which provides for integrated development of all components of the overall system. As a result of this integration development, time is minimized and, at least theoretically, all elements of the system fit together in a harmonious design. Unfortunately, the weapons system concept has come to be identified with the single manager concept wherein the military services designate a single prime contractor for an entire weapons system and delegate the responsibility for the execution of the development (including subcontracting) almost entirely to the prime contractor. Weapons systems project officers (WSPO) are established to monitor the prime contractor's activity, however, personnel limitations for all practical purposes reduce this function to a rubber-stamp type. Consequently, the prime contractor has a free hand to designate major subcontractors and, in many cases, use the contract as a means of creating new facilities at Government expense. These effects pyramid until virtually all the activity is conducted by a few favored companies with large stockpiles of engineers and facilities, built from Government funds. The contract fees are very large, as the prime contractor not only profits from work performed directly in his own laboratory and factories, but also from the work performed in the laboratories and factories of subcontractors. A further difficulty is presented in that research and development effort conducted in and supported by Government laboratories (WADC for example) is either duplicated by the weapons system prime contractor or, quite often, is not afforded the opportunity to influence future weapons systems.

It would seem most desirable to retain the advantages of the weapons systems concept if, at the same time, many of the evils of the single-manager approach could be eliminated. Prior to the present modus operandi it should be observed, the integration of system components into a weapons system was entirely the responsibility of the military services. The single manager concept was sold as a means of obtaining technical competence in systems management, not available to the services because of salary and other limitations in the civil and military service. The single-manager usually designated for aircraft and missiles was an airframe manufacturer who had to train new staffs to manage the nonairframe

aspects of the weapons systems. Quite often the necessary personnel were recruited from civil service but, under the private company salary administration, were paid higher salaries. In the cases which have traveled the full cycle, from conception of the systems idea to full-scale production, satisfactory system integration has not been demonstrated. A weapons system developed under the single-manager concept often cited as a great success (the B–58 bomber) is known to have definite subsystem deficiencies.

Several methods have been propounded for providing satisfactory advice to the services in the field under consideration, but have been found unsatisfactory in practice or rejected for obvious disadvantages. The Civil Service Establishment has been found not to afford the desired result. Educational institutions depart from their true purpose in such attempts. The use of foundations with tremendous resources is politically dangerous and governmentally unsound. Unpaid committees are wanting in incentive and usually consist of persons tied too closely to industry.

It is generally conceded that giving the services the entire management function is undesirable due to personnel limitations. It is equally undesirable, from an economic and technical point of view, to continue to rely on the present arrangement. A method whereby topnotch systems engineers could be brought into the management picture, without bypassing and circumventing direct participation by the services, would be the award of long-term management contract to small, disinterested groups, administered at the top level by Government agencies. These groups would have to be completely divorced from production pressures and implications in order to manage the development objectively. Ideally, they would be staffed by a small number of highly trained and experienced technical people, either in existing companies or by stimulating the formation of such organizations on the invitation for proposals from top-level Defense Department officials. The companies would preferably be nonprofit, and be allowed to pay top salaries as a means of discouraging any tendencies toward "empire building." Thus, there would be no financial incentives based on staff expansion. Apart from the stimulus to the formation of small management companies, which would result in a resurgence of small-business growth and true professional engineering development, a climate would exist which would permit competition for contracts on a "merit" basis for both small and large companies. In this kind of climate, the chances for greater participation by small business in defense contracting would be most certainly increased.

It is suggested that such a system, with properly designed safeguards, be instituted in the newer system programs, due to unfold shortly, aimed at "space" development. The attached diagram[1] indicates how such a procedure would work in a typical weapons-system development. The number of technical specialists in each subsystem area (A, B, C, D, E) would be approximately 6, and total estimated costs for the technical management job for this weapons system would be in the neighborhood of $1 million, a small fraction of the management fee under the single-manager concept.

It is felt that the use of consulting firms, with proper safeguards, is worth an attempt, under carefully prepared statutory direction and departmental regulation. It is suggested that an agreement between the procuring agency and the nonprofit corporation provide that the consulting firm supply the services of named individuals for a period of years; that the procuring agency unequivocally agree to use those sources for a lesser period of years; and that the individuals coincidentally sever all industry and other conflicting interests. The consulting firm should, by effective means, be limited in its powers to activities not inconsistent with the purpose here stated.

Considerable thought should be given to the selection of the time, methods, and agencies affected for this proposal.

S. M. KAPLAN, *President.*

[1] Retained in Committee files.

APPENDIX 1(b)

INDUSTRIAL RESEARCH & DEVELOPMENT,
Tampa, Fla., March 24, 1958.

Hon. GEORGE A. SMATHERS,
Senator From Florida, Washington, D. C.

DEAR MR. SENATOR: From a news item in today's Tampa Morning Tribune I noted with considerable interest that your committee is planning an investigation of Defense Department policies in regard to small-business missile contracts.

On the basis of my own experience, I am convinced that, through your investigation, a great service can be done not only to small business but also to national defense. In disregard of the Small Business Act and to the detriment of the country, the present procurement system excludes effectively from the solution of urgent missile and rocketry problems, scientific and technical talent of individuals engaged in small research enterprises.

The practice of placing all missile research in the hands of large corporations by negotiated contracts seems to be based, at least in part, on the historically unsound proposition that all scientific and engineering talent of the country is concentrated in large firms. My request to the regional SBA office in Atlanta for assistance in being considered as a source of research and development was answered in the negative with the explanation, "The prime contractor is usually a large firm with a large staff of engineers and scientists who can cover all phases of the system."

The truth is, of course, that many important inventions did not come out of laboratories of large corporations. Dr. William J. Kroll, in his article, Individual Invention a Lost Art (Product Engineering, February 24, 1958), points out aptly why men working in large, well-equipped laboratories are not necessarily the most productive research workers.

The theory that small research enterprises can contribute to missile research through subcontracts with prime contractors is, likewise, unrealistic. The blunt truth, known to anyone who has worked for a large corporation, is that their procurement department, too, likes to work on a negotiated basis with 1 or 2 established sources. Indeed, it is a rare case that a prime contractor will even extend the courtesy of acknowledging receipt of a detailed request to be placed on the bidder's mailing list.

Another obstacle in dealing with missile agencies through a prime contractor is the legal protective machinery set up by large corporations against inventions and discoveries made by an independent researcher. To illustrate, there is a military need for a high heat-resistant coating for supersonic aircraft and other airborne weapons exposed to high skin-friction temperatures. I have developed a method by which heat resistance of a commonly used coating material is raised from 200° F. to 600° F. The results are supported by a test certificate from an independent testing laboratory. Under the present system of Defense Department dealing with large prime contractors only, I must go to a large corporation and disclose to it my invention. The corporation, in turn, will not "accept disclosure" unless I sign away all claims. The same situation applies to a solid-propellent development so constituted as to eliminate the outer shell and to save weight and costs. This material, too, has been tested. I have no hesitancy in disclosing to my Government potential missile contributions, but I feel that I should not be forced to give to another private laboratory the fruits of my labor, merely because the Defense Department wishes to deal with large firms only.

Two inquiries to Redstone Arsenal as to what procedure has been set up for a direct disclosure to the arsenal have been left unanswered to date.

I do not wish to imply that a research contract must be given to a small enterprise merely because it is small business. I do feel that small business has a right, as well as an obligation, to contribute to national defense within its limitations of ability. It can do this only if given a chance to bid on the solution of problems known to the agencies of the Defense Department, and if given an opportunity to present directly to the Government its own developments.

It is, furthermore, obvious that the individual or small enterprise seeking acceptance as a source of research must demonstrate the ability and technical qualification required for carrying out a research contract. In my own case, I can show an experience of over 30 years in engineering and research and an excellent testimonial from my previous employer. I am the author of several patents. All of these qualifications have been submitted to research centers of the Army, Navy, and Air Force. Indeed, my requests for being placed on the bidder's mailing list were accepted without any objections.

I resigned my position as research engineer with a Michigan concern 9 months ago for the straightforward reason that I prefer to live in Florida, coupled with

the desire to devote my time entirely to research. After the sputnik appearance, I believed in the administration's expressed intentions in utilizing all available talents for research in missiles, expending my time, money, and energy to continue such research, to bring missile business to Tampa and to employ Tampa residents.

Mr. Senator, your investigation of the Defense Department's procurement policies is timely, indeed. I shall be happy to supply you with further details or to answer any questions that you may have.

Yours very truly,

ERIC SIEMERS.

APPENDIX 1(c)

THE DENVER FIRE CLAY CO.,
Denver, Colo., March 25, 1958.

Senator GEORGE A. SMATHERS,
Senate Office Building, Washington, D. C.
(Attention: Mr. Robert L. Weadock, professional staff member.)

DEAR SIR: It is my understanding that you are interested in learning of experiences faced by small business in seeking prime or subcontracts for the missile program. This information will be used as a basis for questioning procurement officials of the Army, Navy, and Air Force.

The Denver Fire Clay Co. is a small business with about 160 employees, engaged in the production of refractories and the manufacture of industrial furnaces and burners. I will relate two experiences.

Back in 1956, we were awarded contract No. 112116–C by Convair division of General Dynamics Corp., Fort Worth, Tex., for a car-type heat-treating furnace. We thought we clearly understood the specifications and requirements covering the furnace, which was to be used for treating stainless steel and aluminum as an intermediate process. The end product was not confided to us because of security regulations. After installation, we were told the furnace was not acceptable because it failed the tests required. I was present during a second test run, and could not see wherein we failed. However, it then became clear the specifications were subject to more than one interpretation. Accordingly, Convair issued revised specifications with addenda on May 13, 1957. Because of customer relations and our desire to maintain a good reputation, we revamped the furnace at considerable expense to ourselves.

The unit has finally passed Convair qualification tests, but we have not been advised that it has been accepted by the Air Force. (I understand the Air Force requires additional acceptance tests.) We have been paid 80 percent of the purchase price, 20 percent is still withheld. We lost some $5,000 on the job. I readily admit we contributed to our own misfortune, but I feel Convair did likewise. Though I have discussed the matter with Convair and with our local Small Business Administration, I have little hope of price adjustment.

Question. What prompt method of recourse is readily available to small business in seeking adjustments of subcontracts?

Another more recent experience involves a subcontract covering fire brick for a missile launching site at White Sands Proving Ground. We have received a purchase order from the prime contractor under contract No. DA–29–005 ENG 1709. Delivery of the brick is required in April 1958, but I cannot ship them until they have been tested and approved. Since February 25, 1958, we have attempted to have our brick tested by the Ohio River Division Laboratory, Cincinnati, Ohio, without success, because the United States Army Engineer District, Albuquerque, N. Mex., has not issued the necessary authorization for the Laboratory in Ohio to proceed.

Question. Why cannot the prime contractor be delegated the authority to have products involved in his contract tested and accepted?

Generally speaking there are two major problems we face:

1. Obtaining timely and pertinent information on Government requirements.
2. Lack of simplified procedure for clarifying questions involved in contracts and appealing apparent inequities.

A partial solution to the first problem involves the use by the Defense Department and Commerce Department mailing lists. It is my understanding the United States Department of Commerce maintains lists covering business enterprises by product lines or categories. The Denver Fire Clay Co. must report

quarterly to the Bureau of Census on its sales of refractories, and, on another report, its sales of furnaces and industrial products.

Question. Is it not possible for the Defense procurement officials to utilize the Bureau of Census mailing lists to make known pertinent equipment requirements to small firms in the proper product line?

Perhaps there are solutions to the second problem with which we are not familiar. It does seem the regulations are so drawn as to infer that small business consists of connivers determined to fleece the Government. Since we are required to furnish details of our business together with balance sheets describing our financial standing, why cannot dealings under a given contract be conducted in a manner similar to that used in business with private concerns? In other words, eliminate some of the redtape.

Our small firm is definitely interested in prime or subcontracts for the missile program. It would seem we have something to offer in both the refractory and industrial furnace fields. Thus far, however, our efforts have been costly and, for the most part, disappointing.

I sincerely hope some of the questions posed and suggestions offered in this letter will be helpful in a small way.

Sincerely,

J. H. LENTZ, *Vice President.*

APPENDIX 1(d)

CECIL W. ARMSTRONG & ASSOCIATES,
Warsaw, Ind., April 7, 1958.

Senator GEORGE A. SMATHERS,
Senate Office Building, Washington, D. C.

(Attention: Mr. Robert L. Weadock, professional staff member.)

GENTLEMEN: Relative to the public hearings which I understand are to be held during the week of April 15, 1958,[1] by the Small Business Committee's Subcommittee on Government Procurement, we have some questions and comments whih may be directed to the procurement officials, as follows:

1. Why should so much of the engineering, design and drawing work be kept intact by the major missile prime contractors instead of subcontracting portions of such work to small business, particularly to competent professional engineering firms?

(*a*) In almost every major metropolitan newspaper and technical magazine, expensive display advertisements appear offering high wages, travel allowances, paid interview, travel expenses, etc., to qualified applicants.

(*b*) It is quite evident that major contractors build or lease additional facilities to accommodate larger engineering facilities (probably at Government expense).

(*c*) There are many small competent engineering firms, like ourselves, qualified to design component parts, produce detail drawings, etc., who have clearance and facilities to handle security classified work.

2. Shouldn't these prime contractors be encouraged to utilize small-business engineering firms who already have the qualified men, facilities, and who can probably handle a great amount of work promptly and at lower cost than could be done exclusively by the large contractors themselves?

3. We believe that the various excuses offered to us by large missile contractors, such as "too technical, urgent need of action, responsibility," etc., are made so as to permit the spreading of excessive overhead costs over a large number of employees, rather than take advantage of the lower cost of subcontracting.

4. We would be pleased to offer our facilities and services of 20 to 50 experienced engineers and draftsmen to any contractor now seeking assistance. A brochure is attached which describes some of our activities.[2]

Yours very truly,

CECIL W. ARMSTRONG, *Partner.*

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[1] Dates of hearings rescheduled April 29, 30, and May 1, 1958.
[2] Retained in Committee files.

APPENDIX 1(e)

NATIONAL ASSOCIATION OF ENGINEERING COMPANIES
Detroit, Mich., April 10, 1958.

Senator GEORGE A. SMATHERS,
Senate Office Building, Washington, D. C.
(Attention: Robert L. Weadock, professional staff member.)

DEAR SIR: I understand that you are soliciting information concerning proposed changes in procurement policies and practices.

We believe that the enclosed letter contains suggestions on how engineering studies could be made which would permit greater subcontracting.

If you desire any further information, please advise the undersigned.

Very truly yours,

ROBERT A. SULLIVAN,
Executive Secretary.

NATIONAL ASSOCIATION OF ENGINEERING COMPANIES,
Detroit, Mich., April 9, 1958.

Hon. NEIL H. MCELROY,
Secretary of Defense,
The Pentagon, Washington, D. C.

DEAR SIR: You will recall that under date of January 30 and 31, 1958, the executive committee of the board of directors of the National Association of Engineering Companies attempted to see representatives of the Defense Department and/or Army and Air Force to discuss the possibility of greater utilization of independent engineering companies. We were unable to secure such a meeting and therefore are taking this opportunity to request such a meeting.

As you are undoubtedly aware, the National Association of Engineering Companies is a nonprofit trade association consisting of approximately 40 of the leading and reliable independent engineering companies located in the Detroit area. We believe that nowhere in the world is there to be found such a concentration of companies employing such qualified production engineers and industrial specialists which are engaged in such a variety of product-design work and research, in addition to production engineering phases including process planning, design of tools, dies, special machines, fixtures, plant layout, time study, and automation. We further believe that these companies are in a position to render unique and valuable services to all branches of the Armed Forces because of their objectivity, varied and extensive personnel, flexibility in meeting exigencies of particular situations, impartiality (not being engaged in the manufacture of a product, they are able to analyze the process and feasibility of economic and expeditious production without bias or prejudice or even without unconsciously favoring any particular method of production or subcontractor), and their economical rendition of service. Notwithstanding these abilities and the need for imaginative, economical, and fast engineering service, their services and personnel are not being utilized and there is substantial unemployment of qualified production specialists and industrial engineers.

We are attaching an enclosure setting forth the types of engineering service, including analyses and specific examples, rendered by members of the National Association of Engineering Companies.[1] We humbly suggest that the Defense Department might, as a result of a consideration of this information and a further conference, find it advantageous to utilize these engineering companies.

It is our well-considered opinion that an independent engineering company is uniquely qualified to assist in expediting the production of various types of military equipment.

First, as production specialists they could be used to make engineering studies to determine whether the design is "economically producible." Conceivably, these studies could include an analysis to determine whether subcontracting is feasible and whether standardized parts and existing facilities are available. If properly used by procurement officers, the results of such studies could be utilized to avoid concentration of military purchases in a few large companies, which sometimes occurs under the weapons-system concept. Under the weapons-system concept, all phases of research, development, and production, including subcontracting, become the responsibility of the prime contractor. It is recognized that there are instances where it is necessary to use the weapons-system concept; however, there are many items being procured where engineering studies would

[1] Retained in Committee files.

show that the product could be purchased not as an entire system but, rather, broken down into integrated parts which could be purchased directly by the Government from smaller manufacturers; and, of course, there are many items of military equipment which, if proper engineering studies were made, could be purchased directly from small manufacturers. It must be recognized that where the Government purchases entire systems without having available production engineering studies, it must rely entirely upon the prime contractor who may utilize more expensive methods of production and build his own facilities for purposes not related to expeditious and economical production of the end product.

It is believed that such engineering studies will not delay, but, rather, will facilitate the production of the military equipment without interfering with the responsibility of the prime contractor. If producibility studies are commenced upon completion of the research and development of the product and concurrent with the construction of the so-called breadboard model, they should actually expedite production. Research and development engineers working on the construction of a breadboard model are more interested in the function as it relates to the performance specifications than they are in the producibility of the item. Production engineering experience is quite different from research and development engineering experience. Experienced production engineers can work simultaneously and efficiently with research and development engineers.

The use of producibility studies would not interfere with the responsibility of the prime contractor. The purpose of such an analysis is to determine the most expeditious and economical producibility of the item involved. It would involve an evaluation for feasibility of the original design for established requirements and specifications, functional changeability, evaluation for materials, fits and surface finishes, manufacturing methods and manufacturing costs evaluation including motion and time study, evaluation of maintenance requirements, comparable products analysis and evaluation, standards evaluation, availability of latest material and standard parts in order to insure interchangeability, function and producibility of the item in the most economical way for the amount of production needed. These studies would be available to the prime contractor as well as to the Government and in no way would eliminate the responsibilities of the prime contractor for the most economic and expeditious production of the item.

Second, producibility studies could be made in connection with the manufacture of existing products for the purpose of reducing production costs. A review of existing production processes of manufacturing of water materials made by an independent engineering company would result in suggestions showing how such items could be produced more efficiently and economically.

Third, we believe that independent engineering companies could be utilized to prepare engineering data of existing defense facilities which are subject to destruction by war or accidents. Under the single source concept being utilized by the Armed Forces, there is a need for having uniform engineering data available for reproduction of such facilities. Frequently, by the time a product is manufactured, many changes have occurred in the original engineering data which are not available to the Defense Department. Through utilization of independent engineering companies, such data would be kept currently available and would contain such uniformity of product engineering data as to permit the product to be manufactured at another plant. In modern warfare, the necessity of rapid replacement of existing processes and products will be of utmost importance. Where a single bomb can wipe out an entire plant which may be the only source of a particular product, without proper product engineering data the production replacement would be slow if not impossible. It is felt that the independent engineering companies of Detroit, by being familiar with all phases of industrial engineering, could establish desired uniformity and also make available to the Armed Forces engineering data for rapid reproduction of destroyed facilities.

In order that you may be fully acquainted with the qualifications of these companies, we are enclosing herewith detailed information showing their ability to perform services of the type outlined.

We would appreciate your advising us as to what date we may further discuss this matter.

Very truly yours,

ROBERT A. SULLIVAN, *Executive Secretary.*

APPENDIX 1(f)

AERONAUTICAL MACHINISTS, INC.,
Bridgeport, Conn., April 11, 1958.

Senator JOHN SPARKMAN,
Senate Office Building,
Washington, D. C.

DEAR SENATOR: Enclosed please find a brief that we have completed which has a relationship to your missiles and small-business hearings, on April 15, 16, and 17, 1958.[1]

We ask that your committee make this brief a part of your records of the referenced hearings.

We do want to extend our sincere gratitude for the great effort that you, personally, have put forth on behalf of small manufacturing companies in the United States.

Thank you.

Sincerely yours,

ARTHUR J. GLEASON, *Vice President.*

SMALL COMPANIES IN METALWORKING INDUSTRY NOT GETTING DIRECT UNITED STATES GOVERNMENT PRIME CONTRACTS

We in the metalworking industry find that terrific publicity has been developed and propagated for assistance to small business, by Government agencies and the Small Business Administration.

While intent and purpose may have been genuine, proper application for effectiveness has not been forthcoming.

The very heart of our economic system, small metalworking companies are primarily dependent on prime contractors for their very existence and must be satisfied with the crumbs that are thrown to them.

We experience a strange phenomenom whereby large companies secure United States Government contracts on a negotiated basis and what small amount of business that is offered to small companies is offered on a bid basis.

Several large companies may compete on a negotiated contract on the one hand, but when it comes around to small companies on a bid basis anywhere from 25 to 100 small companies bid on a single item or items.

Great emphasis has been stimulated to buy cheaply from small companies, whether it be the United States Government itself or prime contractors.

It should be of divine interest for any individual in a United States Government position who professes to want to help small companies in the metalworking industry to read the Seventh Annual Report of the Activities of the Joint Committee on Defense Production, Report No. 1172.

Pages 353 to 384, inclusive, represent a report of the Small Business Administration.

Also it should be of interest and guidance to read pages 257 and 258 of Report No. 1172.

While pages 257 and 258 do not mention the metal working industry specifically, several revealing factors relative to small business are very prominent.

Example:

Small business bid was not low.
Small business bidder not responsible.
Small business not responsive.
Small business not accepted for other reasons. (Work too complex.)
Small business did not bid.

Report No. 1172 states that small business received 19.8 percent of United States Government business—1956–57. What part of the 19.8 percent of this business went to the metal working industry should be of real concern to those wanting to fortify this industry. Also, what part of the 19.8 percent represented direct United States Government contracts.

Machine tool program of report No. 1172 pages 102 through 109 also produces some interesting material relative to our machine-tool builders.

Example: United States Government owned tools which the services have in private facilities:

No rental charge	125,000
On a rental basis	18,000
Total	143,000

[1] Dates of hearings rescheduled April 29, 30, and May 1, 1958

It is reasonably clear that the referenced 18,000 tools are primarily leased by small companies.

The reserve tool replacement program has been almost totally ineffective although Congress appropriated $450 million for purchase of tools in fiscal years 1954 through 1956. Only $15.4 million was actually obligated.

The 1958 budget, for replacement of tools lags, especially by the Army who own one-third of tools on hand.

For fiscal 1958 the services have in budget for replacement of machine tools:

	Million
U. S. Navy	16. 3
U. S. Air Force	30. 0
Department of Army	0
Tools:	
In use in U. S. Government and private facilities	208, 000
In idle inventory	83, 000

The Small Business Administration does not have the proper authority to do a real job for small companies and is to a great degree, ineffective.

Design and developing and production contracts are not going to small companies.

Only 4.3 percent went to small companies in fiscal 1956–57.

It appears that the multitude of United States services—Army, Navy, Air Force, and Signal Corps, local and areawise find it convenient to justify their personnel setups by preying on small companies with a multitude of forms, relative to investigative surveys, etc., and do a good job of discouraging small companies from doing business with the Government.

We will attempt to list a number of reasons why small companies in the metal-working and machine tool building industry are not getting a reasonable share of United States Government prime contracts.

(*a*) Regional offices of the services throughout the United States of America send out far too many requests for bid on a particular procurement.

(*a1*) Anywhere from 25 to 100 requests for bid are sent out.

(*b*) On replacement items it is almost impossible for other companies to compete.

(*b1*) Original company is completely tooled up and no doubt the Government has paid for tools and on replacement bid no allowance made for tooling.

(*b2*) The only possible chance another company would have is one whereby the Government paid excessively high prices on the original contract.

(*c*) So-called field inspection and examination by glorified service jobholders can in many cases deprive a company from getting a prime contract.

(*d*) Denial of a prime contract due to financial instability arrived at once again by a services' glorified jobholder should be dispensed with.

(*e*) Small companies not given proper recognition on negotiated contracts.

(*f*) Small companies are not getting proper share of design, development and production contracts.

(*g*) Present policy of going all out to large prime contractors is restricting the growth and development opportunities of small companies.

(*h*) Small companies should be given an opportunity to build sections of major end items for the services on direct United States Government prime contracts.

(*i*) An absolute percentage of all United States Government prime contract dollar value in business should be established for the metal-working and machine-tool building industry (direct basis).

We ask that every possible consideration be given to our recommendations herewith:

1. On items up for purchase a rotating system within the services be established, whereby a particular regional office alone would send out 10 to 12 requests for bid on a particular procurement.

Example: Redstone Arsenal, Huntsville, Ala.; Springfield Ordnance, Springfield, Mass., would send out bids in their immediate area. No other regional office would send out bids on the same identical requirement.

2. Local banking and business references should be accepted in lieu of a financial statement, for financial responsibility.

3. Local United States services should recommend small companies to procurement centers for prime contract consideration, and prime contracts be executed forthwith with the recommended small companies.

4. Small companies should be able to expand their organization where needed to participate in a substantial United States Government Prime Contract and not

be denied this contract by reason for not having sufficient personnel at the particular time.

5. Negotiated prime contracts should be offered to small companies recommended by local United States Navy, Army, and Air Force services.

6. Capable field engineers from the services should get off of their soft cushions and visit small companies and make recommendations to the procurement centers.

7. Field engineers of the services by visitation should recommend small companies for design, development and production contracts.

It is our contention that small companies possess the comparable ingenuity and know-how to develop and expand their companies for prime contract performance on a substantial basis.

Large prime contractors rely on the overall ingenuity of small companies to fulfill their prime contract obligations.

If our country is to remain strong, the metalworking and machine-tool building industry must be given loaves of bread in the form of direct United States Government prime contracts and not the crumbs now being parceled out to small companies by prime contractors.

ARTHUR J. GLEASON,
Vice President, Southern Connecticut Tool & Die Manufacturers' Association, Affiliate, National Tool & Die Manufacturers' Association.

APPENDIX 1(g)

STRATEGIC INDUSTRIES ASSOCIATION,
Los Angeles, Calif., April 23, 1958.

Hon. GEORGE A. SMATHERS,
Chairman, Subcommittee on Military Procurement, Select Committee on Small Business, United States Senate, Senate Office Building, Washington, D. C.

DEAR SENATOR SMATHERS: In connection with your current hearing on the subject of small-business participation in the military procurement program, Strategic Industries Association regrets very much its inability to send a representative to testify in person.

There are several phases of the military procurement picture with which we are most deeply concerned and we have prepared a formal statement, enclosed, which we certainly hope you will receive in lieu of personal testimony.

If your committee has any questions relative to the points raised, we would be more than happy to have the opportunity to answer them.

Respectfully yours,

JOHN MARSCHALK, *Executive Director.*

SMALL BUSINESS SUBCONTRACTING IN THE MISSILE AGE—STATEMENT BY STRATEGIC INDUSTRIES ASSOCIATION

The participation of small and independent business in the production of missiles, rockets, and related military equipment involves a series of problems and basic concepts with which this association has been deeply concerned during the past 4 years. We desire to state the principles upon which we feel small business should participate and then to offer suggestions for solution of the inevitable problems which these principles pose.

We believe that—

1. The primary purpose of defense procurement must be to secure the best possible defenses, and any other purpose must be subordinate to this.

2. The only fair share of defense procurement deserved by either small business or large is that share which it can produce to the highest quality, with the greatest economy and with assurance of reliable delivery.

3. The ingenuity, flexibility, and resourcefulness of skilled small firms, experienced in the techniques and requirements of military procurement is more vital from a military standpoint than is generally recognized.

4. The techniques of the missile age involve specialized knowledge and skills far beyond standard commercial requirements and are frequently incompatible with commercial production.

5. Maximum use of free enterprise incentives—including the opportunity to earn extra profit—is the greatest means to assure increased competition, rapid advances in technology, and net lowest cost to Government.

6. Government subsidies, particularly in the form of rent-free productive equipment, should be avoided except in extreme emergency; no company should be given a competitive advantage through its control of Government plant buildings, productive machines and other facilities.

TO SECURE THE BEST POSSIBLE DEFENSES

Changes in defense technology since World War II have been so rapid as to be almost beyond human grasp. A single thermonuclear warhead can have the explosive power of all the bombs carried by all the Allied air forces in all the European raids of World War II. In a little over 10 years we have pushed the speed of airborne devices from 470 miles per hour to more than 20,000 miles per hour.

The nature of these changes has had a drastic impact on the industrial capability required to build weapons. We have not merely been building 1940-type weapons bigger and faster; we are building entirely different weapons, calling for entirely new skills and techniques.

For example, there is a host of new metal alloys developed for weapons use because of superior strength-for-weight ratios and ability to resist the high temperatures encountered in the thermal barrier. Such metals are far too expensive for flatirons, bicycles, or automobiles, but essentially cheap to meet the demands of the space age. The handling of these metals requires a completely separate body of know-how from that demanded in commercial fabrication.

Similar examples exist in every other sort of material—in plastics, chemical compounds, electronic parts, ceramics, printed circuitry. Not that a regular commercial manufacturer could not learn these special techniques and ultimately be able to meet the essential quality standards. But unless he has participated in the evolution of these radically different procedures, he is under a severe handicap—a handicap that can become equally serious to military strength if procurement practices are influenced so as to require award of technically complicated production to firms of doubtful defense skills.

We are aware that the criterion of defense production capability is sometimes misused, with the result that favored contractors have been given awards for which they are no more capable than their prospective competitors, but we feel it would be a national mistake to ignore the necessity of placing skill and reliability as the foremost criteria by which awards should be made.

FAIR SHARES OF CONTRACTS SHOULD BE AWARDED BY SKILL

We are also aware of misuses in respect to preferences for awarding certain contracts to large businesses over small. Elephantiasis of a business is no assurance of technical competence. Nor is the number of engineers employed on a project any assurance that it will be carried forward with speed. There appears, in fact, to be a point of diminishing returns in which an increased number of engineers on a specific assignment may necessitate so much time in conferences as to guarantee that there will be little progress at all.

These observations bring us to note that there are many thousands of experienced smaller firms which have specialized in defense production, have originated and pioneered thousands of the technological developments, and are fully capable in meeting military requirements.

MILITARY VALUE OF SKILLED SMALL FIRMS

Among the membership of this association are typical independent businesses which have originated and pioneered some of the most valued modern-day defense production skills. To name a few, these include the vacuum metallizing process by which hydrogen embrittlement is eliminated as a problem in cadmium coating, the metal bonding of fiber glass with ultra light weight and microfinish surfaces, an integrated logistic system for the ground handling and servicing of jet aircraft, the design-engineering of the first VTOL aircraft, the first successful volume production techniques for titanium bolts and related fasteners, a one-third weight reduction in low-pressure liquid-oxygen converters, the first heat-reducing electronic tube shields, the most successful heat-reducing electronic cabinet design, and countless other developments in process and designs, many of them still of secret classification.

With few exceptions, these developments of independent industry have been accomplished entirely at private expense, with privately owned equipment and at private risk. They establish clearly that small and independent firms with

experience in defense make limitless and vital contribution to military progress—so long as free enterprise incentives and opportunity permit them to do so.

INCOMPATIBILITY WITH COMMERCIAL PRODUCTION

Few of the skills of defense specialists find common ground with commercial requirements. Taking an example from the foregoing developments mentioned, the heat-dissipating tube shield was developed because excessive heat generated in military electronic equipment was found to be a major cause of failure and unreliability. The failure of tubes in home radios and television sets is a commercial inconvenience. The failure of tubes in a radar warning network or a missile guidance system may be a catastrophe. A tube shield which might be generally satisfactory to eliminate most of the inconvenience in home usage could be developed to minimum quality standards and would not have to resist the shock and vibration environment common to military uses. The shields required by the military must be manufactured to infinitely close tolerances; they must perform. The training of manufacturing personnel to accept nothing less than perfection, the development of microscopic quality controls, is economically unjustifiable for other than military need. It is the only thing the military dare accept.

To illustrate, if the electronic parts of a modern missile are made to quality standards which assure a failure rate of not greater than 1 part in 100,000, it is a mathematical certainty that at least 1 missile in 3 will be a misfire. Hence, the entire atmosphere and psychology surrounding production of missile components must be entirely opposite from what we would consider commercial environment.

NEED FOR FREE-ENTERPRISE INCENTIVES

If our statement to this point has helped to enforce the contention that military procurement of technical items should not be risked from firms of less than certain technical competence, we feel it will have served the best interests of the Nation.

But it should not be misinterpreted to reinforce those who misuse the need for capability as an excuse to maintain our defense production in the exclusive control of a favored handful of leading firms. To do so, we believe, it as discouraging to initiative and development as any possible conduct of procurement might be. Yet, this is what we see happening.

According to information published by the Air Force in 1957, the top 100 companies now have in their possession approximately 90 percent of all the Air Force owned productive equipment—to a total of several billion dollars—and the bulk of this equipment is on a rent-free basis. A similar situation exists with respect to plants and equipment financed by the Navy.

It is generally recognized that possession of such equipment carries heavy weight in the award of contracts. Production resources men within the military are naturally reluctant to show any such facilities in idle status, and there is a logical inducement to follow one contract with another in order to keep such facilities active. Similarly, where the possessors of such equipment can keep it busy by competing for subcontracts (with the economic advantage of rent-free operation) it is only human for the military men who originally sponsored such installations to approve the practice on the contention that the Government benefits.

Ignored in such practice, however, are the twin facts that (1) the existence of idle, but available, Government-owned production equipment is a positive assurance of expansion capacity in time of emergency, and (2) the competitive destruction of defense-skilled privately owned facilities spells certain death of emergency expansion capacity. Ignored, also, is recognition of the basic competitive incentive which forces independent companies to excel in order to survive.

GOVERNMENT FACILITIES, FOR EMERGENCY ONLY

Nearly every industry-operated Government-owned facility originated to support a specific contract because private facilities were not available. Though it can be shown that many such facilities were installed without a complete survey of an area to determine what privately owned facilities were actually available, the fact we wish to keep uppermost is that the use of these emergency facilities is invariably continued long after the contract for which they were installed has been completed, and without further check as to whether an emergency need may still exist.

The end results are to stultify both the incentive of the Government equipment possessor to perform to maximum and the incentive of independent firms to risk

investment in equipment and development which would forward the sum of defense skills.

It is our conclusion that competitive incentives cannot be turned to the advantage of military need unless competitive equity is restored by assuring that no Government facilities are permitted to be operated by industry without payment of adequate rental fees comparable to the costs of private ownership. Further, that the use of Government production facilities, whether in Government or industry hands, should be discontinued whenever it is shown that competitive private sources are available to bid on the work. In short, the role of Government production facilities should be that which was originally intended, for emergencies only.

IMPACT OF MISSILE TECHNOLOGY

Certain physical aspects of missile production technology need to be related to the specific problem of small business participation. While a missile is a form of aircraft—and the airframes for missiles will most logically be produced by the companies with the greatest skills in aircraft production—there are some very important differences, particularly in terms of subcontract opportunity.

It is apparent that a much higher percentage of cost is involved with electronic components, fuel and powerplant systems, guidance, etc. Proportionately, much less is involved in the missile structure. This means a far lower demand for traditional machining work, "mechanical manufacturing." Instead, there is demand for electronic components, relays, valves, special motors, instrumentation, precision sheet-metal work to make the "black boxes" that hold electronic systems.

An immediate result of this switch in technology is a subbasement plummeting of the demand for independent machine shop skills. Some of this precipitous decline might not have occurred if the major firms had not felt the need to fill the machining gaps caused by the 1957 cancellation and stretchout of former aircraft programs. But the long run decline of need is obvious, simply because the missile, even in volume production, will be built with less machining than required for conventional aircraft.

The subcontractor for missiles is thus faced with the necessity of being skilled in the new technologies. Unless he keeps abreast and ahead of these technological demands, there is simply no place for him.

CAN INCREASED GOVERNMENT-FURNISHED EQUIPMENT HELP SMALLER FIRMS?

It has been suggested that the ability of smaller firms to participate in the missile program can be enhanced if the military retreats somewhat from the weapon systems concept and returns to the practice of buying and furnishing to missile producers more standardized components (Government-furnished equipment).

Such a step would seem to satisfy the immediate selfish interests of smaller firms such as those represented by this association. Yet we oppose it.

One reason is our recognition that missile development and production must be absolutely fluid. As a nation we cannot afford less than the best. A missile maker must have complete freedom to buy a better component the instant it is offered. Hence, while standardization has a good sound, it also involves limitation on development, a serious concern in view of the evidence that we must "catch up" with our potential enemy. And once an item is "standardized" it takes the weight of mountains to secure military authorization for change.

Another reason is the risk of destroying incentive to invent. The main thing an independent manufacturer has to sell is his ingenuity, his ability to design and make something a little better than the next fellow. He can only maintain this inventiveness if he continues to have a chance at the profit rewards which inventiveness should earn.

It is charged that the weapon systems concept encourages prime manufacturers to take over—to copy designs originated by independent suppliers and manufacture these items themselves. We believe these charges are justified. But our experience with direct sales to the Government is no more encouraging. On countless occasions, military buying agencies have insisted on obtaining the design details of privately developed proprietary items for the purpose of conducting advertised bidding from competitors who have invested nothing in developments of their own. It is the smaller independent firms who are the most subject to this design piracy for the very reason that what they produce is most likely to be of a size and type which lends itself to the advertised procurement. By contrast, the larger firms, holding contracts for complex missiles, are automatically

protected from public competition (even on Government-financed designs) by the very size and complexity of the items they produce.

The cure, as we see it, is not to dispense with the weapon systems concept, but first, to reinforce it by greater insistence that the prime producers deliver the performance capabilities which their contract specifications require, and second, to strenghthen the protection of original proprietary designs at every level of procurement, so as to preserve maximum incentive for new and radical advances in design. Where either the Government, acting as direct purchaser, or a prime, buying from a subsupplier, finds that a proprietary design gives maximum performance in a specific need, the type of competition to be invited should be solely on a performance basis. That is, potential competitors should be invited to submit their own designs of equal or superior performance. Thus, no potential supplier would be subsidized by having free use of another firm's privately developed data. And every developer would know that superiority of performance would assure competitive success and dollar reward.

(NOTE.—The revision of military procurement regulations covering copyrights and proprietary data, as recently promised by Assistant Secretary of Defense Perkins McGuire, should give substantial help toward assuring the continued participation of skilled small firms in the missile production program.)

RESTORATION OF INCENTIVES

Equitable protection of proprietary rights is only one of the necessary incentives which must be restored if small and independent business is to have opportunity to participate in current defense programs.

Statistics on the current trends in military subcontracting will show, just as prime contract awards data already shows, that small business participation is rapidly declining. Yet we are aware that thousands of independent firms have all the experience and skill to take a leading part in missile development and production.

It must be apparent that the present military small business programs which rely on "urging maximum subcontracting with small business" are ineffectual. We doubt that increased subcontracting with small business can be obtained either by "urging" or by beating prime contractors with a club. But we feel just as strongly that any kind of law which would demand a fixed percentage of military purchasing from small business, either at prime or subcontract levels, would be entirely injurious to the procurement program.

In place of clubs, we recommend carrots.

The Renegotiation Act as now enforced is the primary deterrent to extensive subcontracting. Last year, the Renegotiation Board modified its regulations, paragraph 1460.14 (b) (3), to reduce the penalty imposed on prime contractors when they engaged in subcontracting with small business. Important is the fact that a penalty still exists. Regardless of the fact that a prime contractor may show a specific reduction in total cost to the Government by making a purchase from a subsupplier skilled in some specialized phase of work, the Board has indicated that the prime could not be allowed to make as much profit as it would had it elected to copy the designs of the supplier and do the work in its own (or the Government's) plant.

We recognize the existence of a general theory which condemns the idea of a profit-on-a-profit. If it were true that the exclusion of a profit-on-a-profit assured a net lower cost to Government, it would be right to cling to the theory. Such is not the case. As citizens we do not hesitate to engage a general contractor to build a building. He assumes responsibility; he supervises the work of the many subcontractors; he exercises skill in selecting the subcontractors who can best perform their specialized functions.

Why should the Government exclude itself from the same benefits in the subcontracting of missile components and services? The small and independent firms that are specialists can do similar work for a number of different primes. They gain the extra skill and economy which comes from serving multiple users. Duplicating departments within the prime plants cannot match the experience and specialized knowledge of supplier firms. Why put the premium on using lesser skills? Why the penalty on employing the higher subcontract skills?

Representative William Hill (Colorado) introduced a bill (H. R. 10859) in the second session of the 84th Congress which would have amended the Renegotiation Act to provide for the encouragement of subcontracting. In the rush to extend the act for an additional 2 years, the amendment was not then considered. We believe such an amendment would go a long way toward reversing the present

negative incentives and give force to the desire of Congress to increase small business participation in the military program. The wording of Congressman Hill's proposal was as follows:

"Section 103 (e) of the Renegotiation Act of 1951, as amended (setting forth factors to be taken into account in determining whether profits are excessive), is amended by adding at the end thereof the following: 'In determining excessive profits, favorable recognition must be given to subcontracting to small and independent business concerns, and a contractor or subcontractor who achieves economies through the program of the Department of Defense and the Small Business Administration to increase the share of small and independent business concerns in military procurement shall, subject to other considerations set forth in this subsection, be provided incentive rewards through proportionately higher profit allowances.' For purposes of the preceding sentence, the term 'small and independent business concerns' as of any time has the meaning then agreed to by the Department of Defense and the Small Business Administration."

A further amendment proposed by Representative Hill would have given additional incentive for small and independent firms to compete for Government prime and subcontracts by providing that two types of contracts might be excluded from the renegotiation procedure: (1) contracts which, by their terms, were subject to review and price redetermination, and (2) contracts which had been awarded as the result of competitive bidding to the low bidder among three or more responsive competitive bidders. It was felt, and the members of this association agree, that the military procedure of price redetermination assures thorough review and elimination of any possible excess profit (sometimes, of any profit at all) and that the fact of having secured a contract as the result of a low bid among responsive competitors is assurance against unconscionable profits.

The purpose of these amendments is to provide increased incentive for small and independent business to seek Government contract opportunities. From data compiled on the lack of small business quotations on many items classified by the military as "within the small business potential," it appears that more and more small firms are shying from Government contracts because of the double jeopardy involved—first in risking the loss of proprietary design rights, second in the uncertainty of profits earned through competitive superiority.

CONCLUSION

It will be observed that this statement has made three basic recommendations designed to make possible increased participation by small and independent business in programs of military missile procurement:

1. Eliminate the inequitable subsidized advantage of major prime producer now gained through their rent-free use of Government-owned production equipment and facilities; specifically, require that any such equipment and facilities be used only on the basis of a rental charge comparable to the cost of private ownership. (A bill to permit the direct collection of rentals by the military services—instead of payment to the general fund of the Treasury—may be necessary to effectuate this recommendation.) Further, the installation and use of Government-owned production facilities should be limited to proved emergencies where ample survey has shown that competitive privately owned facilities are unavailable to do the work.

2. Reinforce the regulations to assure protection of proprietary products and designs of military usefulness developed at private expense. Thus, provide "incentive for the inventive" and prevent the piracy of designs either by prime contractors or Government agencies.

3. Restore normal profit incentives by assuring that the renegotiation procedures will neither penalize economies secured through subcontracting, nor doubly jeopardize contractors who have either had prices redetermined or restricted through competitive bidding.

The Strategic Industries Association wishes to express its appreciation for this opportunity to present its views on the three recommendations which it consider most vital to assure maximum small business participation consistent with essential superiority in defense material.

APPENDIX 2

UNITED STATES SENATE,
SELECT COMMITTEE ON SMALL BUSINESS,
March 28, 1958.

Hon. NEIL MCELROY,
Secretary of Defense, Department of Defense,
Washington, D. C.

MY DEAR MR. SECRETARY: The Small Business Act of 1953 (Public Law 163, 83d Cong., 1st sess.) which created the Small Business Administration states the following with regard to the policy of the Congress concerning small business:

"It is the declared policy of the Congress that the Government should aid, counsel, assist, and protect insofar as is possible, the interests of small-business concerns in order to preserve free competitive enterprise, to insure that a fair proportion of the total purchases and contracts for supplies and services for the Government be placed with small-business enterprises and to maintain and strengthen the overall economy of the Nation."

In keeping with its responsibility of insuring that the intent of Congress is being carried out in this regard, the Subcommittee on Government Procurement of the Senate Small Business Committee each year holds public hearings looking into the small-business programs being conducted by the Department of Defense and other agencies of the executive branch performing a significant procurement function.

In view of the markedly increased expenditures currently being made by the Defense Department in the fields of guided missiles, rocketry, and outer-space exploration it was determined by the members of the full committee that particular attention would be focused upon these programs during this session of Congress. The 15th, 16th, and 17th of April have now been selected by the subcommittee to develop this matter with government and industry representatives.[1]

It is felt that the situation concerning the share of prime contract dollars being awarded to small business in these fields is sufficiently grave to warrant your personal attention. However, in deference to the numerous demands currently being made upon your time it was concluded by the subcommittee that Mr. Perkins McGuire, Assistant Secretary of Defense for Supply and Logistics, and Mr. William Holaday, Director for Guided Missiles, would constitute excellent witnesses to explore this problem with the members of the committee.

In addition to these spokesmen, the subcommittee is especially desirous of discussing with Mr. Roy E. Johnson, Director, Advanced Research Projects Agency, the steps being taken to insure that our smaller firms have an equitable opportunity to participate in our outer-space exploration programs. The 4 or 5 "lunar probes" recently approved by the President indicate to the committee that it is not too early to insure that procedures are adopted by this agency which will permit adherence to the intent of Congress that the independent supplier is to participate in the expenditure of all appropriated dollars. It is appreciated that the President intends to recommend legislation providing for a civilian agency to eventually administer this program, however, it is felt that the establishment of proper procedures here at the outset, providing for the participation of small businesses, would minimize our task in the future. This future, according to the President's Scientific Advisory Committee, might well involve the expenditure of $2 billion in the short span of a decade.

Of particular interest to the committee would be testimony from appropriate Defense Department or military service spokesmen covering, among others, the following topics:

A. The evolution and development of missiles and rockets in all military services:
   1. The role of universities, scientific laboratories, etc.
   2. The role of military installations and facilities.
   3. The role of private industry, large and small.
   4. The physical characteristics of missiles.

B. Factors considered in determining Defense missile requirements:
   1. Office establishing overall missile needs.
   2. Factors considered in determining military service responsibility.
   3. Mobilization base dispersal considerations covering selection of missile bases, sites, etc.
   4. Security clearance policy for private firms.

[1] Hearings subsequently rescheduled for April 29, 30, and May 1, 1958.

C. Past, current, and future expenditure levels:
   1. Total dollars appropriated and expended in fiscal years 1955, 1956, and 1957 for missiles, rockets, and outer-space exploration programs.
   2. Total dollars appropriated and obligated for fiscal year 1958.
   3. Total dollars programed, by each military service, for fiscal year 1959.

D. Statistical presentation depicting small-business share of prime contract dollars, by each service, in field of missile and rockets, including ground-support equipment.

E. Policies governing missile research and development contracting (all services):
   1. Negotiated versus advertised bidding.
   2. Types of contract being utilized, i. e., cost-plus-fixed-fee, incentive, price redeterminable, etc.
   3. Factors considered in selecting firms to be solicited for bid.

F. Policies governing missile production contracting (all services):
   1. Government furnished equipment versus contractor furnished equipment.
   2. Negotiated versus advertised bidding.
   3. Types of contracts being utilized.
   4. Subcontracting programs.
   5. Factors considered in selecting firms to be solicited for bid.

G. Contracting procedures to be followed in negotiating contracts for outer-space exploration program.

H. Contracting procedures being followed by the military service or services concerned in connection with each of the following:
   1. Ground support equipment for missiles and rockets.
   2. Construction of missile sites.
   3. Contracting for missile detection and warning systems.
   4. Contracting for antimissile missiles.

To report on the various missile and rocket programs within the respective military services it is requested by the subcommittee that the below listed witnesses, accompanied by support personnel of their own choosing, testify at the time and date specified:

April 15, 1958, 10 a. m., Old Supreme Court Chamber, the Capitol:
   1. The Honorable William M. Holaday, Director of Guided Missiles, Department of Defense.
   2. The Honorable Roy W. Johnson, Director, Advance Research Projects Agency, Department of Defense.
   3. The Honorable Wendell B. Barnes, Administrator, Small Business Administration.
   4. Industry witnesses.

April 16, 1958, 10 a. m., room 457, Senate Office Building:
   1. The Honorable E. Perkins McGuire, Assistant Secretary of Defense (Supply and Logistics).
   2. The Honorable Frank H. Higgins, Assistant Secretary of the Army (Logistics).
   3. Maj. Gen. J. H. Hinrichs, Chief, Army Ordnance Corps.
   4. Maj. Gen. John B. Medaris, Commander, Ordnance Missile Command.
   5. Maj. Gen. H. N. Toftoy, Deputy Commander, Ordnance Missile Command.
   6. Maj. Gen. E. C. Itschner, Chief of Engineers.
   7. Maj. Gen. J. D. O'Connell, Chief, Signal Corps.

April 17, 1958, 10 a. m., room 457, Senate Office Building:
   1. The Honorable Dudley C. Sharp, Assistant Secretary of the Air Force (Materiel).
   2. Maj. Gen. Bernard A. Schriever, commander, Air Force Ballistic Missiles Division, Air Research and Development Command.
   3. Maj. Gen. William D. Senter, Director, Procurement and Production, Air Materiel Command.
   4. Maj. Gen. Victor R. Haugen, Director, Systems Management, Wright Air Development Center.
   5. Maj. Gen. Ben I. Funk, Deputy Director for Ballistic Missiles, Air Materiel Command.
   6. The Honorable Fred Bantz, Assistant Secretary of the Navy (Materiel).
   7. Rear Adm. P. D. Stroop, Chief, Bureau of Ordnance, United States Navy.
   8. Rear Adm. R. E. Dixon, Chief, Bureau of Aeronautics, United States Navy.
   9. Rear Adm. W. F. Raborn, Director, Navy Polaris Projects, United States Navy.

It can be said at this time that the committee is deeply concerned about the extremely low percentage of prime contract dollars currently being awarded our smaller firms in the defense missile programs. It is hoped that through the medium of these hearings we can mutually explore the circumstances which have brought about these wholly unsatisfactory percentages, and devise means or programs whereby increased contractual opportunities for missiles can be made available to small business.

It would be appreciated if the Defense Department witnesses could make available to the subcommittee 10 copies of their individual statements before noon of April 14, 1958.

Very sincerely yours,

GEORGE A. SMATHERS,
Chairman, Subcommittee on Government Procurement.

APPENDIX 3

OCTOBER 6, 1956.
No. 4275.2
OASD (P. and L.)

DEPARTMENT OF DEFENSE DIRECTIVE

Subject: Industrial facilities funded from procurement and production appropriations.

References:

(*a*) DOD Directive 4275.2 dated November 24, 1954, revised April 19, 1956.
(*b*) DOD Instruction 4275.4, October 6, 1956.
(*c*) DOD Directive 4215.9, paragraph VII A 1, dated February 2, 1956.

I. AUTHORIZATION AND PURPOSE

To establish the Department of Defense policy, to fix responsibilities for review and approval of the acquisition, expansion, construction, rehabilitation, and improvement of industrial facilities, and to provide for the establishment of procedures designed to expedite and assure the adequacy of the review process.

The term "industrial facility" for the purpose of this directive means property (including land, buildings, structures and improvements, and machine tools and other related production equipment) for the production or maintenance of military end items or components, and for tests, research, development, and services in support of production.

II. BASIC POLICY

A. The Department of Defense supports the basic principle that free competitive enterprise should be fostered by the Government. Therefore, the provision of Government-owned industrial facilities will be authorized only when it can clearly be demonstrated that private enterprise is unable, unwilling, or not organized to perform the service or provide the products necessary to meet current and mobilization requirements, or that in the execution of the military mission the ownership of the facility by the Government is a necessity.

B. When Government-financed industrial facilities are required they shall be provided only to the extent necessary to meet procurement requirements or to provide a minimum base for meeting mobilization requirements.

C. No Government-financed test facilities shall be constructed at a privately owned plant if such facilities duplicate Government-owned test facilities already available, unless it can be established that existing Government-owned facilities, regardless of service control, are being utilized to full capacity, or that existing Government-owned facilities are inadequate from the standpoints of technical characteristics, workload capabilities, or excessive distance from the development or production source of the weapon or equipment.

D. The heavy cost and the large land areas frequently required for test and development facilities make it imperative that maximum utilization be made of each facility owned by the Government. Therefore, the following rules will be observed:

(*a*) Each facility shall be acquired in a manner and under circumstances in which the Government's interest is complete and exclusive.

(*b*) Each facility shall be operated in accordance with a periodically established test program; wherever two or more military departments are engaged in programs involving a particular facility, the test program shall be arranged by mutual agreement between the interested departments.

(c) Under regulations established by the Secretary of the cognizant military department, the technical findings resulting from operation of Government-owned facilities shall be the property of the Government and shall be made available for such dissemination and use as may, from time to time, be found to be in the interest of the Government.

E. The cognizant military department will make the following determinations, prior to submitting requests for authority to acquire major common-use type facilities such as airfields to be used for acceptance testing by contractors, liquid oxygen plants, acceptance test stands, large environmental facilities, and nuclear test facilities:

(a) The suitability of other like Government-owned facilities under the control of the Department of Defense, regardless of present occupancy, that are located within a reasonable distance of the proposed site, and the possibility of joint usage;

(b) The location of the proposed facility is the most suitable for the immediate requirement and the estimated present and future requirement of other contractors, and/or components of the Armed Forces;

(c) Where a future demand appears probable provisions have been made in the facility design to allow for suitable expansion if necessary.

F. The construction or installation by the Government of nonseverable structures or industrial facilities on privately owned land is discouraged. Whenever such construction is so located, the Government's investment for future mobilization production shall be protected by suitable contractual arrangements.

G. Rehabilitation and modernization of Government-owned industrial facilities will be undertaken only after a complete review of the mission of the facilities in light of new and advanced types of weapon systems.

H. Prior to providing Government-owned industrial facilities for the production of new weapons or for the expansion of production for existing weapons, efforts shall be made in all cases to utilize existing facilities to the fullest possible extent. Such efforts are intended to preclude the building or procuring of new Government-owned facilities. The test for retention in a standby status of existing Government-owned facilities will be whether the mobilization requirement is sufficiently urgent to justify the expenditure of funds at this time for the construction of new Government-owned facilities for the mobilization requirement.

I. All new projects undertaken or sponsored shall comply with such dispersal standards as may be issued by proper Government authority.

J. In general, the Department of Defense will not undertake financing of industrial facility expansions unless it can be demonstrated that it is necessary for the Government itself to perform or support the required production or service.

III. IMPLEMENTATION

A. The Assistant Secretary of Defense (Properties and Installations) will be responsible for developing and supervising procedures to implement the policies established in section II hereof, and for recommending to the Secretary of Defense a course of action on each facility project submitted as provided herein.

B. The Assistant Secretary of Defense (Properties and Installations) shall issue instructions designed to expedite the review process within the Office of the Secretary of Defense by furnishing the military departments in advance with a check list of information required for OSD review of industrial facilities proposals. The Assistant Secretary of Defense (Properties and Installations) shall also arrange for concurrent review by appropriate agencies within OSD.

C. All other agencies of OSD shall, upon request of the Assistant Secretary of Defense (Properties and Installations), furnish him with their comments and recommendations with respect to the proposed expansion of any facility in their respective functional areas.

D. The Secretaries of the military departments will develop and carry out a continuing program as follows:

(a) Develop an integrated long-term plan for development and production in each important technical product area;

(b) Provide an analysis and review of proposed facility expansions to determine their necessity in support of established long-term development and production plans as well as conformity with the policies established in section II hereof;

(c) Forward to the Secretary of Defense for his approval via the Office of the Assistant Secretary of Defense (Properties and Installations) all industrial

facility expansion projects involving an expenditure of $1 million or more, in accordance with reference (*b*);

(*d*) Provide upon request such information and data as may be required by the Assistant Secretary of Defense (Properties and Installations) and other agencies of the Department of Defense in the exercise of their responsibilities established in pars. A and C of this section.

(*e*) Issue such instructions as may be necessary and appropriate to expedite the review process within their respective departments; and

(*f*) Submit to the Assistant Secretary of Defense (Properties and Installations) within 60 days from the date of this directive a copy of their regulations implementing this directive.

IV. CANCELLATION

DOD Directive 4275.2 dated November 24, 1954, revised April 19, 1956, is hereby canceled.

V. EFFECTIVE DATE

This directive shall become effective 60 days after date of issue.

REUBEN B. ROBERTSON, Jr.,
Deputy Secretary of Defense.

APPENDIX 4

MARCH 27, 1958.
No. 4200.10
ASD (S. and L.)

DEPARTMENT OF DEFENSE DIRECTIVE

Subject: Department of Defense Policy and Responsibility in the Rapid Tax Amortization Program
Reference: (*a*) DOD Directive 5220.5: Industrial dispersion.

I. PURPOSE

This directive establishes DOD policies on the rapid tax amortization program and the processing of applications for certificates of necessity, and assigns responsibilities for this program.

II. APPLICABILITY

The provisions of this directive apply to all DOD participation in the rapid tax amortization program, and govern the consideration of all applications for certificates of necessity.

III. GENERAL BACKGROUND

A. The Internal Revenue Code of 1954, section 168, provides for the granting of certificates of necessity to authorize the rapid amortization of certain "emergency facilities" required in whole or in part in the interests of national defense. Administration of the rapid tax amortization program is assigned to the Director of the Office of Defense Mobilization.

B. The Department of Defense will be requested to supply information and recommendations to the ODM on the relationship of military requirements to proposed facilities expansions.

C. Public Law 85–165 restricted the tax amortization program to research and development for DOD or AEC, and to the production of new or specialized defense items or components (excluding services) for which existing capacity is unsuitable.

D. The Office of Defense Mobilization has closed all expansion goals and restricted the granting of certificates of necessity to direct defense needs, under the revised ODM Regulation 1A. (See enclosure No. 1.)

IV. POLICY

The general policy of ODM is that tax amortization will be granted only to applications eligible under Public Law 85–165 and recommended by the Department of Defense or the Atomic Energy Commission. The general policy of the Department of Defense is to recommend approval of specific applications only when there are no suitable facilities to meet DOD requirements for new or specialized items or research and development programs.

A. *Production facilities.*—The ODM will certify only those production facilities necessary to support military and AEC procurement needs to meet current or currently foreseeable requirements for new or specialized defense items; i. e., military-type end items, and special components or special materials peculiar thereto, for which no substantial civilian market is anticipated. DOD will recommend favorable consideration of individual applications for expansion of production capacity only when there is a demonstrable need for the proposed expansion to meet Department of Defense program objectives, and there is no known capacity capable of producing the product. Where facilities exist which could produce a defense item, regardless of the availability of such facilities for the required rate of production, tax amortization for new facilities will not be supported. An exception may be made if there is justification for requiring special defense features, such as design, construction, location, or the need for their being built underground, etc.

B. *Research and development facilities.*—ODM will certify only those research and development facilities which support military or AEC research and development programs. The DOD will comment as to the necessity for expansion by an individual applicant only when there is a direct or substantial DOD interest in the research or development to be performed by the applicant.

C. *Dispersal.*—The industrial dispersal policy expressed in reference (*a*) will be applied to tax amortization cases. DOD will not recommend waiver unless there is justification, based on military requirements, for the proposed location.

V. RESPONSIBILITIES WITHIN DOD

A. The Assistant Secretary of Defense (Supply and Logistics) is assigned responsibility for the administration of the rapid tax amortization program within the Department of Defense. This includes (1) the promulgation of uniform instructions and procedures; (2) establishment of the DOD policy on the use of rapid tax amortization as an incentive to private industrial expansion, with the coordination of other interested Assistant Secretaries of Defense; and (3) recommendations on applications for accelerated tax amortization.

B. Each military department will be responsible for furnishing necessary data to the ASD (Supply and Logistics), the observance of the policies set forth herein and in other relevant DOD directives, and for the preparation of comments and recommendations in accordance with the guidelines and instructions provided in appendix A on all applications referred to it by the Office of the Assistant Secretary of Defense (Supply and Logistics). Report exemption symbol DD–S&L (EXR)75 has been assigned to the requirement for comments and recommendations made directly to ASD (Supply and Logistics).

VI. IMPLEMENTATION

A. The military departments will:

1. Designate one office within the Washington headquarters as responsible for coordinating tax amortization matters;
2. Take the necessary measures to insure compliance with the policy and the assignment of responsibilities set forth herein, as implemented by the instructions contained in appendix A of this directive; and
3. Submit two copies of any implementing instructions and regulations to the ASD (Supply and Logistics) upon issuance.

VII. EFFECTIVE DATE

This directive is effective on date of issuance.

NEIL MCELROY,
Secretary of Defense.

APPENDIX A

GUIDELINES AND INSTRUCTIONS FOR TAX AMORTIZATION CASES

DOD Directive 4200.10 establishes the general DOD policies and assigns responsibility to the Assistant Secretary of Defense (Supply and Logistics) for the administration of the tax amortization program. The following guidelines shall be used in the implementation of this Directive and are supplementary to ODM Regulation 1A (enclosure 1).

A. Agency responsibilities and general policy on determination of necessity for expansion

1. Office of Defense Mobilization is the agency designated by Executive Order 10480, dated August 14, 1953, as amended, to carry out the provisions of section 168 of the Internal Revenue Code of 1954 with respect to applications for certificates of necessity to permit rapid tax amortization. Public Law 85–165 amended the code, limiting the rapid amortization program to provide facilities for research, development or experimental services for AEC or DOD, and for production of new or specialized items or new or specialized components of new or specialized defense items (excluding services) procured by or for the account of the DOD or AEC for which existing facilities are unsuitable. By issuance of revised ODM Regulation 1A: Issuance of Necessity Certificates Under Section 168 of the Internal Revenue Code, of 1954 as amended, ODM has prescribed the regulations, including definitions and criteria, for the guidance of all concerned. The certifying authority is the Director of the Office of Defense Mobilization. The general policy of the certifying authority is that tax amortization will be granted only on applications eligible under Public Law 85–165 and recommended by the DOD or AEC.

2. Delegate agencies under Executive Order 10480 are assigned tax amortization responsibilities in the same areas as their delegations under title I of the Defense Production Act of 1950, as amended:

(*a*) The Secretary of Interior with respect to petroleum, gas, solid fuels, and electric power.

(*b*) The Secretary of Agriculture with respect to food and with respect to domestic distribution of farm equipment and commercial fertilizer.

(*c*) The Commissioner of the Interstate Commerce Commission who is responsible for the supervision of the Bureau of Service of the Commission, with respect to domestic transportation, storage, and port facilities, or the use thereof, but excluding air transport, coastwise, intercoastal and overseas shipping.

(*d*) The Secretary of Commerce with respect to all other materials and facilities.

Delegate agencies are, in general, those which furnish supply-requirements information to ODM on which the determination of the need for expansion is based.

3. Department of Defense is not a delegate agency, but is responsible for providing total requirements information on military items (such as DMS class A products), and on other items, such information as would be most helpful to the responsible delegate agency or the certifying authority. DOD is also responsible for recommending approval or denial of specific applications for rapid amortization. If additional facilities are needed, and are eligible under ODM Regulation 1A and DOD criteria (B below), a recommendation will be made for the issuance of a certificate of necessity to encourage the use of private capital.

B. DOD criteria for recommending approval or denial

All provisions of ODM Regulation 1A, including definitions and criteria, are binding on DOD, and should be made available to persons processing tax amortization cases. The following paragraphs particularize the provisions of ODM Regulation 1A to DOD responsibilities.

1. In general, all recommendations for approval of specific applications must be based on the need for additional facilities for DOD procurement of new or specialized items, or research and development programs. Facilities acquired solely for increased efficiency, convenience, or economy are not certifiable.

2. Production facilities for items or components (excluding services) are eligible for certification if—

(*a*) The item to be produced is procured by or for the DOD primarily or exclusively;

(*b*) No substantial civilian market is anticipated for it; and

(*c*) The item is new or specialized to an extent that makes existing facilities unsuitable.

(1) "Unsuitable" facilities: Facilities are suitable if they can produce the required item, whether or not at the required rate. To justify support for rapid tax amortization, new or specialized items must require facilities of different capabilities from facilities already in regular production or special defense features are justified as provided in (*d*) below.

(2) "Regular production" means that the item or component has been produced in quantities exceeding those for experimental or test purposes, or on other than a pilot line basis.

(*d*) Facilities for the production of a new or specialized item or component may be certified if such facilities have one or more specialized defense features even

though there are other suitable facilities in existence. A facility has specialized defense features if its design, construction, location, or other comparable special DOD requirements for the facility are controlled solely by considerations of national defense. This means that, above and beyond the usual technical requirements of facilities for the required production, an underground site, protective construction, etc., is warranted and can be justified.

If suitable facilities exist (i. e., there are known facilities in the continental United States, capable of producing the required item), additional facilities will not be recommended for certification, whether or not the capacity is available. Thus, except as provided in (*d*), above, only if a new item or a model change requires replacement of existing facilities or creation of new facilities, would facilities be eligible for certification.

3. Research, developmental, or experimental facilities required to support DOD programs (other than civil functions) will be supported if DOD has a direct [1] or substantial [2] interest. If the applicant does not have DOD contract(s) for the work, facilities will be supported only when the research and development can be associated with and is complementary to an identifiable DOD research and development project or program.

4. Services: Facilities for performing services, even though necessary to production or research and development, are not eligible unless such services are an integral part of the production or research and development facility and constructed or acquired by the same taxpayer who owns the production or research and development facilities, and the production or research and development facility itself is eligible. "Services" include provision of transportation, storage, communications, water, sewerage, power, heat, refrigeration, fuel, etc. For tax amortization purposes production processes, such as, fabrication, assembling, testing, or modification, etc., are not considered "services," and such facilities may be supported if otherwise eligible.

5. Production facilities, eligible under the above criteria, will be supported if the proposed expansion was started or completed as a result of a current or currently foreseeable DOD contractual requirement and was supportable at the time the applicant filed with ODM. On an application that was filed and expansion started prior to cancellation of a contract or reduction of schedules, an additional qualifying statement is to be included indicating that at the present time the proposed facilities are not required to meet current DOD requirements as a result of a reduction in schedule due to budget cuts or other pertinent facts.

6. Consideration will be given to the following factors, and comments to Supply and Logistics or ODM will include relevant statements:

(*a*) DOD interest in the product, or research and development can be clearly defined. Actual verification of the need for the production or research and development service is important.

(*b*) In connection with research and development facilities, the percentage of the applicant's existing capacity devoted to DOD is direct [1] or of substantial [2] interest.

(*c*) The expansion is necessitated by military procurement contracts or research and development requirements for items of special military nature which cannot be accomplished within existing facilities. (A written statement from the reliable prime or major subcontractor usually responsible for locating sources of supply, that he can find no suitable capacity for a special component or material far down the chain of production, is acceptable.)

(*d*) The extent of the current military backlog of orders in the applicant's research and development facilities with respect to known capacity warrants the expansion.

(*e*) Experience with the applicant's manufacturing, research, or development qualifications has a special bearing in the evaluation of the necessity for expansion of his facilities. This includes special consideration of proprietary items, superior performance, quality control, etc.

(*f*) Procurement experience indicates that there is no suitable capacity to produce or develop the necessary items.

(*g*) A special military urgency necessitates the expansion of existing facilities.

(*h*) Any other special factors which indicate a definite need for expansion to fulfill military requirements must be examined and fully explained.

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[1] "Direct" means that the proposed facilities will have at least 75 percent use on prime or subcontracts of the DOD.

[2] "Substantial" means that at least 75 percent of the output of the proposed facilities will be for defense prime or subcontracts, or the specific facilities are of such importance to the DOD that Government appropriations would have to be requested for comparable facilities if not provided by investments of private capital.

7. Extension of time: Requests for extension of time on certificates will be considered under the criteria which were in force when the original certificate was issued. For production facilities, extensions of certificates issued prior to August 22, 1957, may be supported if there is a shortage of available capacity, i. e., the case need not meet the criteria of B 2, above provided the request for such extension was filed with ODM prior to the expiration of the certificate. However, the Department of Defense will not make recommendations on a request for extension of time for a certificate that was issued on the recommendation of another agency. Facilities expansions that were originally supported by DOD will be given continued support if the need for the expansion remains. Specific facts known to DOD as to the cause of delay and other relevant data will be furnished, if requested on any case, whether or not it was originally supported by DOD.

C. Agency responsibilities and policy on waiver of dispersion, as related to tax amortization

1. *Office of Defense Mobilization.*—Establishes dispersion criteria and has authority to waive dispersion criteria when it is determined to be in the best interest of national defense. The ODM policy, criteria, and responsibility on waiver of dispersion on tax amortization cases is as follows:

(*a*) Except as noted below, all applications for rapid tax amortization for the construction of new facilities or for major expansions of existing facilities will be reviewed by the Office of Area Development, Department of Commerce, to determine whether the proposed location of such facilities complies with DMO I–19. The following types of facilities are considered to comply with the dispersion policy:

(1) Underground facilities in a nondispersed area, such as pipelines;

(2) Mobile facilities with no fixed locations, such as airplanes, ships, and railroad rolling stock.

(*b*) This dispersion policy shall not be applicable to the following new facilities or expansion of existing facilities:

(1) Any expansion of existing facilities which represents not in excess of 50 percent of the capacity existing at the present site: provided, however, that the costs of such facility expansion as estimated by the applicant does not exceed $5 million.

(2) New facilities, other than an expansion of existing facilities, estimated by the applicant to cost less than $1 million.

(*c*) Additions to existing facilities and new facilities in areas which do not conform to the dispersion policy and which do not come within the meaning of paragraphs (*a*) and (*b*) shall not be certified for tax amortization except in unusual cases which qualify under the following rule:

(1) The facility under consideration is determined to be necessary to satisfy a Department of Defense or Atomic Energy Commission requirement which cannot be met by existing facilities or from facilities now being constructed or planned.

(*d*) In determining whether a given facility is eligible for an exception under the rule stated in paragraph (*c*), a fully documented justification shall be obtained from the appropriate delegate agency having mobilization responsibilities in the industry area involved and also from the appropriate procurement agency.

2. *Department of Commerce.*—The Department of Commerce, through its Office of Area Development, has responsibility for determining if a proposed location is considered to be satisfactorily dispersed from metropolitan target areas (does or does not meet ODM criteria).

3. *Department of Defense.*—(*a*) The OASD (Supply and Logistics) determines if the proposed location is satisfactorily dispersed from present or proposed key military installations and key industrial facilities—(does or does not meet DOD criteria). This is an OASD (Supply and Logistics) responsibility on tax amortization cases which are not exempt under ODM policy as stated in paragraph C.1 above (including those for which AEC is the recommending agency). The Departments will be afforded an opportunity to comment, by separate inquiry from Supply and Logistics, on cases when the location is satisfactorily dispersed but there is a question of interference with operations of military installations.

(*b*) When the Department of Commerce determines that the proposed plant site in a tax amortization application does not meet ODM criteria on dispersion, or the OASD (Supply and Logistics) determines that the proposed site does not meet DOD criteria on dispersion, the military department(s) furnishing comments on individual tax amortization applications will be requested to include their

position on waiver of dispersion criteria, with justification if recommending approval. The DOD policy on industrial dispersion it contained in DOD Directive 5220.5.

(*c*) In cases where position on waiver of dispersion is requested, the following considerations may serve as a guide in determining whether or not a waiver should be recommended:

(1) Is the proposed facility an integral part of an existing facility?

(2) Do the applicant's ultimate development plans take cognizance of the Government's dispersion objectives so that future expansion, particularly for production of a new item, may be located in a dispersed area?

(3) Has the applicant considered other measures that will reduce the vulnerability of the proposed expansion?

(4) Are the applicant's reasons for not locating in a dispersed area valid, i. e., are there compelling industrial-economic reasons for not locating the proposed facility in an area classified as nonvulnerable.

(5) Is the urgency of time an overriding factor?

If the above considerations can be answered in the affirmative, a recommendation for waiver of dispersion may be warranted. Waiver may also be warranted when one (or more) consideration is of overriding importance.

D. Procedure for tax amortization cases

1. All tax amortization cases for DOD comment on necessity for expansion will be sent by ODM to OASD (Supply and Logistics).

2. The Office of Production Policy is designated as the staff element of the OASD (Supply and Logistics) responsible for coordinating activities in connection with requests for comments and recommendations in connection with applications for certificates of necessity. The ASD (Supply and Logistics) (or his Deputy, in his absence) will make recommendations for the DOD concerning these requests. The Secretaries of the Departments will similarly restrict authority to sign recommendations to ODM or Supply and Logistics.

3. Designated persons in the Washington headquarters of the Departments of the Army, Navy, and Air Force, and the OASD (Supply and Logistics) will maintain liaison with each other, with delegate agencies, and with the ODM.

4. All requests for DOD determination on eligibility under DOD dispersion criteria (C, 3 (*a*), above) will be coordinated within Supply and Logistics, and departmental comment on interference with operations of military installations will be secured as appropriate, as "dispersal cases." Comment on waiver will be requested by Supply and Logistics at the same time a tax amortization case is referred to a department for its recommendation of approval or denial.

5. The following chart shows generally the manner in which cases referred to the DOD by ODM will be routed to determine necessity for expansion and eligibility for tax amortization.

6. Comments on applications for certificates of necessity for accelerated tax amortization on which DOD has been requested to recommend action to the certifying authority, will be handled as follows:

(*a*) Upon receipt from Supply and Logistics of a request (SD 257) for DOD comments and recommendations, each military department will, unless otherwise requested, reply direct to ODM on cases that do not require waiver of dispersion criteria, and are of interest primarily or solely to that department,[3] provided the estimated cost of expansion is less than $1 million. Information copies of such comments should be forwarded to the other departments and to the OASD (Supply and Logistics).

(*b*) Departmental recommendations on applications of interest to 2 or more departments, those in which the estimated cost of expansion is $1 million or more, those involving waiver of dispersion criteria, or where no military department has an expressed interest, and also those in which the department wishes to make an exception to the policy expressed in B, above, should be forwarded to the OASD (Supply and Logistics) for preparation of reply to ODM.

(*c*) A departmental recommendation to Supply and Logistics or ODM for approval or denial on an individual application will include a summary of the relevant facts developed in evaluating the case (par. B, 6) and reference to the criteria on which the recommendation is based.

(*d*) It will the responsibility of the OASD (Supply and Logistics) staff element or the military department presenting comments and recommendations to ODM

[3] A department assigned plant cognizance, as in aircraft, or monitorship responsibility, as in electronics will be considered the interested department, responsible for preparing coordinated departmental comments to ODM or OASD (Sypply and Logistics).

on an application to maintain the necessary records supporting such action. By mutual agreement between ODM and OASD (Supply and Logistics), a copy of the application, ODMF-2, may be retained by the DOD. Where the department replies direct to ODM, the copy of the application will be retained in the department; where the reply is made by OASD (Supply and Logistics), the copy of the application will be retained in OASD (Supply and Logistics).

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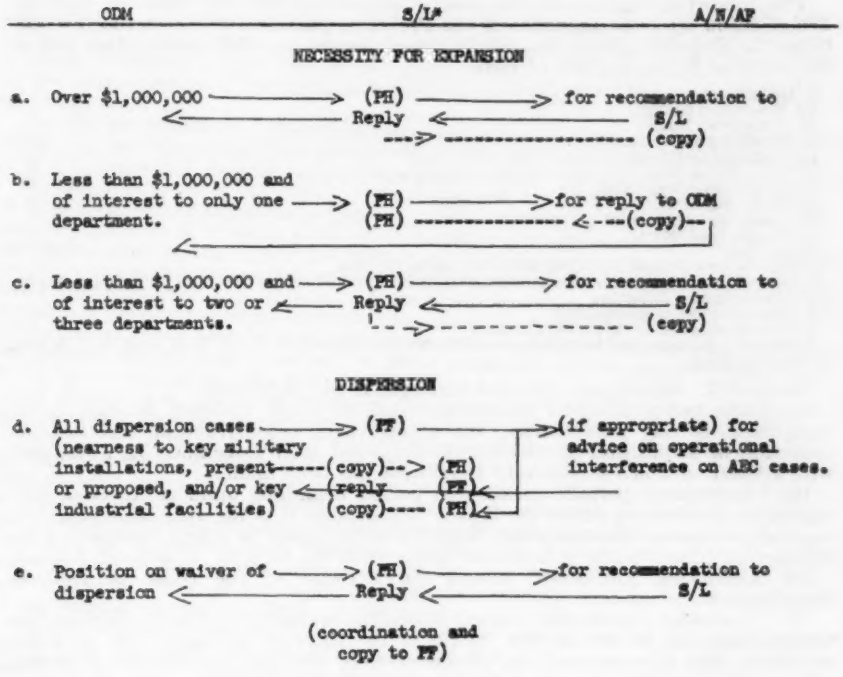

* S/L PH - Schedules Branch
PF - Industrial Facilities Protection Branch

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TITLE 32A—NATIONAL DEFENSE, APPENDIX

CHAPTER I—OFFICE OF DEFENSE MOBILIZATION

[ODM Reg. 1A]

ODM REG. 1A—ISSUANCE OF NECESSITY CERTIFICATES UNDER SECTION 168 OF THE INTERNAL REVENUE CODE OF 1954

The following regulations are hereby prescribed by the Office of Defense Mobilization with the approval of the President pursuant to the authority contained in Executive Order No. 10480, dated August 14, 1953, and section 168 of the Internal Revenue Code of 1954.

1. Definitions:
(a) Emergency facility.
(b) Emergency period.
(c) Certifying authority.
(d) Necessity certificate.
(e) New defense item.
(f) Specialized defense item.
(g) New component.
(h) Specialized component.
(i) Regular production.
(j) Services.
2. Criteria for determination of suitability of existing facilities.
3. Criteria for determination of portion of the adjusted basis attributable to defense purposes for computing the amortization deduction.
4. Procedures and responsibilities.
5. Exercise of powers of Certifying Authority.

AUTHORITY: Sections 1 to 5 issued under sec. 168, 68A Stat. 52; 26 U. S. C. 168, E. O. 10480, 18 F. R. 4939, 3 CFR, 1953 Supp.

SECTION 1. *Definitions.* As used throughout this regulation:

(a) "Emergency facility" means any facility, land, building, machinery or equipment, or any part thereof, the construction, reconstruction, erection, installation or acquisition of which was completed after December 31, 1949, and with respect to which a Necessity Certificate has been made.

(b) "Emergency period" means the period beginning January 1, 1950, and ending on the date on which the President proclaims that the utilization of a substantial portion of the emergency facilities with respect to which Necessity Certificates have been made is no longer required in the interest of national defense.

(c) "Certifying Authority" means the Director of the Office of Defense Mobilization.

(d) "Necessity Certificate" means a certificate made by the Certifying Authority pursuant to section 168 (e) (2) of the Internal Revenue Code of 1954, certifying that the construction, reconstruction, erection, installation or acquisition of the facilities referred to in the certificate is to be used.

(1) To produce new or specialized defense items or components of new or specialized defense items (as hereinafter defined) during the emergency period, or

(2) To provide research, developmental, or experimental services during the emergency period for the Department of Defense (or one of the component departments of such Department) or for the Atomic Energy Commission, as a part of the national defense program, and stating the portion of the adjusted basis thereof which has been determined to be attributable to defense purposes within the meaning of such section 168 (e) (2) for computing the amortization deduction under section 168 (a).

(e) A "new defense item" means a new product or material (excluding services) which was not in regular production prior to January 1, 1957, and which is or it is expected will be produced for sale to the Department of Defense (or one of the component departments of such Department) or to the Atomic Energy Commission to meet current or currently foreseeable requirements and for which it is anticipated there will not be any substantial civilian market.

(f) A "specialized defense item" means a product or material (excluding services) for which it is anticipated that there will not be any substantial civilian market and which is or it is expected will be produced for sale to the Department of Defense (or one of the component departments of such Department) or to the Atomic Energy Commission to meet current or currently foreseeable requirements.

(g) A "new component" means a component which was not in regular production prior to January 1, 1957, and for which it is anticipated there will not be any substantial civilian market.

(h) A "specialized component" means a component for which it is anticipated that there will not be any substantial civilian market.

(i) "Regular production" means that the item or component has been produced in quantities exceeding those for experimental or test purposes, or on other than a pilot line basis.

(j) Except in the context of "research, developmental, or experimental services", the word "services" means provision of transportation, storage, communications, power, water, fuel, sewerage, heat, refrigeration and other similar ancillary activities and materials and excludes production processes, such as fabricating, assembling, testing, retrofit or modification, and irradiation of materials.

SEC. 2. *Criteria for determination of suitability of existing facilities*—(a) *For the production of a new defense item.* Facilities for the production of a new defense item or a new component of a new or specialized defense item may be certified if existing productive facilities are unsuitable because of the newness of the item or the component or if the facilities qualify for certification under subsection (c) of this section.

(b) *For the production of a specialized defense item.* Unless facilities are qualified under (c), below, certifications will not be granted in connection with the production of a specialized defense item or of a specialized component of a defense item.

(c) *When specialized defense features are involved.* Facilities for the production of a new or specialized defense item or a new or specialized component thereof may be certified if existing productive facilities are unsuitable because of the specialized defense features of the item or component thereof, and if the facilities are required and designed for such production, and if the facilities have one or more specialized defense features. A facility has specialized defense features, if above and beyond the usual technical requirements of facilities for the production of the new or specialized defense item or the new or specialized component thereof, its design, construction, location or other comparable features are controlled solely by considerations of national defense.

(d) *Determining the unsuitability of existing facilities.* The unsuitability of existing facilities shall be determined from a consideration of whether the item or component could be produced with existing facilities without regard to whether or not the existing facilities are available for the required production. Where an item or component has not been in regular production prior to January 1, 1957, but it is a variation of an earlier model which was in such production and the variation is such as to require substitutions, modifications or alterations of existing facilities, or to require new facilities, certification may be granted for such substitutions, modifications, alterations or for new facilities. Certification will not be granted where it can be shown only that existing facilities are inadequate or unavailable for the required rate of production.

(e) *For research, developmental, or experimental services for the Department of Defense (or one of the component departments of that Department) or the Atomic Energy Commission.* Facilities for research, developmental, or experimental services may be certified where such services are required to provide research, developmental, or experimental services during the emergency period for the Department of Defense (or one of the component departments of such Department), or for the Atomic Energy Commission, as a part of the national defense program. The certifications for facilities to perform research, developmental or experimental services may not be made for facilities connected with the civil functions of the Department of Defense or in connection with work on peacetime usage of atomic energy that might be undertaken by the Atomic Energy Commission.

(f) *In general.* The following types of facilities will not be considered for certification:

(1) The acquisition of the productive assets of a going concern or second hand facilities unless:

(A) Clear prospect of a substantial increase in the usefulness of such facilities for national defense exists and such increase cannot be obtained by other practical means; or

(B) Substantial loss of usefulness for national defense would probably result in the absence of such acquisition.

(2) The construction, reconstruction, erection, installation, or acquisition of that part of a facility which is or will be used in lieu of existing facilities, except to the extent considered extraordinary and necessitated by reason of the Emergency.

(3) Facilities acquired from the Government.

(4) Facilities constructed or acquired for purposes of leasing to a defense contractor.

(5) Facilities for the provision of "services" unless

(A) Such services are an integral part of the production or research and development facility; and

(B) Constructed for or acquired by the same taxpayer who owns the production or research and development facilities; and

(C) The production or research and development facility is itself eligible under section 2.

(6) Production facilities constructed or acquired for mobilization reserve purposes, as distinguished from facilities designed to meet current or currently foreseeable defense production needs.

(7) The construction of any facility unless located, insofar as practicable, so as to reduce the risk of damage in the event of attack.

SEC. 3. *Criteria for determination of portion of the adjusted basis attributable to defense purposes for computing the amortization deduction.* Determination will be made by the Certifying Authority as to the portion of the adjusted basis upon which the amortization deduction under section 168 (a) shall be computed. In determining the portion to be certified, the Certifying Authority will consider the probable economic usefulness of the facility after five years and the additional incentives to the minimum amount deemed necessary to secure the expansion of industrial capacity in the interest of national defense during the emergency period. For this purpose, consideration will be given to such factors as the character of the business, including the source, amount and nature of the materials required for the expansion and the material or service to be produced; the manufacturing or servicing processes involved; normal depreciation rates; expansion in competitive fields; the extent of risk assumed, including the amount and source of capital employed; the potentiality of recovering capital or retiring debt through tax savings or pricing; the relative expansion needed; the economic consequences of the location of the facility due to security or other emergency factors; increased costs due to expedited construction or emergency conditions the historical background of the industry; the extent to which the facility is being or will be used in lieu of existing facilities; assistance to small business and the promotion of competitive enterprise; compliance with Government policies, e. g., manpower and dispersion; and other relevant factors. Land will not ordinarily be certified. The percentage certified shall be closely related to the provision of other financial incentives provided by the Government to encourage the construction of facilities, such as direct Government loans, guarantees and contractual arrangements, so that these incentives separately or in combination will secure the needed expansion at minimum cost to the Treasury. Where percentage certification patterns for individual industries are established, adjustments upward or downward may be made for special factors.

SEC. 4. *Procedures and responsibilities*—(a) *Application form.* Formal application shall conform to the standard form prescribed by the Certifying Authority and shall be executed in the manner and by the person prescribed by the form. The standard form of application for a Necessity Certificate may be obtained from the Office of Defense Mobilization, Washington 25, D. C., or from Department of Commerce field offices.

(b) *Classified information.* If the application or its filing would involve the disclosure of information which has a security classification, the applicant shall, prior to the filing of his application, request instructions from the Government agency with which he has classified contract relations.

(c) *Filing of application.* All applications for Necessity Certificates shall be filed with the Office of Defense Mobilization in Washington, D. C., and shall be deemed to be filed when received by that agency.

(d) *Time of filing applications, and cases in which determination of necessity must be made before beginning of construction.* (1) Application for a Necessity Certificate for facilities acquired on or subsequent to August 22, 1957, must be filed before the expiration of six months after the date of such acquisition.

(2) Applications for Necessity Certificates for any building, structure or other real property, or for the installation of facilities which will become an integral and permanent part of any building, structure or other real property the construction, reconstruction, erection or installation of which is begun on or after August 22, 1957, must be filed prior to the beginning of such construction, reconstruction, erection or installation.

(3) For purposes of section 4 (d) (2) hereof and the time limitation provision which appears on the face of Necessity Certificates, the following definitions shall apply:

(A) Construction, reconstruction, erection or installation is deemed to begin with the incorporation in place on the site by the applicant or by any other person pursuant to any contract, understanding or arrangement, directly or indirectly for or with the applicant, of physical materials as an integral and permanent part of any building, structure or other real property (for example, the pouring or placing of footings or other foundations). Acquisition of land; engineering; contracting for construction; preparation of site; building of access roads; excavation; demolition; installation of service utilities required for construction; the fabrication, production or processing of building materials or building equipment; or the acquisition of personal property to be installed in the building, structure or other real property does not constitute beginning of construction, reconstruction, erection or installation.

(B) Acquisition takes place when title passes or a contract to acquire is entered into.

(C) If the total dollar amount of the facilities which have been certified (without consideration of the percentage of certification) does not exceed $1,000,000 the requirements of the time limitation provision in Necessity Certificates will be satisfied with regard to (i) certified facilities to be acquired (e. g., machinery, equipment, etc.) and used in connection with certified buildings or structures if the taxpayer begins the construction of such buildings or structures within the time specified, and (ii) the beginning of construction, in that the beginning of construction of any structure certified will be considered to be the beginning of construction of all structures certified if several separate structures are involved.

(e) *Modification of regulations.* The provisions of this regulation concerning the filing of applications for Necessity Certificates may be changed by the Certifying Authority. Such change shall be made effective not less than 15 days after publication in the FEDERAL REGISTER.

(f) *Referral of application.* Each application, after acknowledgment, will be referred to that agency or officer of the Government according to its respective assigned responsibilities under the Defense Production Act of 1950, as amended, called "delegate agencies", and to the Department of Defense or the Atomic Energy Commission as appropriate.

(g) *Responsibilities of agencies and officers other than Certifying Authority.* Agencies of the Government to which an application is referred shall be responsible for making a report and recommendation for specific action to the Certifying Authority regarding each application. Such report shall include the reasons for the recommendation and shall conform to instructions issued by the Certifying Authority.

(h) *Action by the Certifying Authority.* After consideration of the relevant factors, including but not limited to the reports of the delegate agencies, and the Atomic Energy Commission or Department of Defense, the Certifying Authority will take action upon the application.

(i) *Necessity Certificates.* Upon approval of an application, a Necessity Certificate will be forwarded to the Commissioner of Internal Revenue and will constitute conclusive evidence of certification by the Certifying Authority that the facilities therein described are necessary in the interest of national defense and of the portion of the adjusted basis upon which the amortization deduction under section 168 (a) shall be computed. The Certifying Authority will not certify the accuracy of the cost of any facility nor of any date relative to the construction, reconstruction, erection, installation or acquisition thereof. It will be incumbent upon taxpayers electing to take the amortization deduction to establish to the satisfaction of the Commissioner of Internal Revenue the identities of the facilities, the costs thereof, and the dates relative thereto.

(j) *Further description after certification.* (1) Where the actual description or cost of a certified facility varies or will vary so materially from the description or cost in the application for a Necessity Certificate as to put in question the identity of the facility, the taxpayer may request an amendment of the certificate by filing a statement with the Certifying Authority setting forth the revised description or cost.

(2) It is to be considered that there is not so material a variation as to put in question the identity of the facility and therefore that the varied description or cost is within the scope of the original certification and no amendment is necessary in the following cases:

(A) Where the facility acquired or constructed is the same as that certified even though the actual cost exceeds the cost of the facility as estimated in the certificate.

(B) Where the facility acquired or constructed varies from the facility certified and the actual cost exceeds by not more than 15 percent the cost estimated in the

certificate. It is not intended that the certificate is to be considered as a dollar-amount authorization which may be exceeded by not more than 15 percent so as to include any additional facilities. For the purpose of the 15 percent limitation the word "facility" as employed above contemplates consideration separately of each item as listed in Appendix A (of the standard form of application for a Necessity Certificate).

(3) The statement should consist of four copies of an amended Appendix A setting forth all of the emergency facilities certified with their revised descriptions or costs in the same order in which such emergency facilities were listed on the original Appendix A. However, where the original Appendix is lengthy and only a few variations or changes are involved, the four copies of the amended Appendix A may list only the facilities changed. In all instances, the amended descriptions or costs should be identified, by item and page number, with the descriptions or costs contained in the original Appendix A and should be accompanied by a letter explaining all changes with the reason therefor.

(4) If the Certifying Authority is of the opinion that the varied or changed costs or descriptions are within the scope of the original certification, the amended Appendix A will be forwarded by the Certifying Authority to the Commissioner of Internal Revenue for substitution for the original Appendix A attached to the original certificate to have the effect of an amendment thereof. A copy of the amendment will be transmitted to the taxpayer.

(5) Although reasonable substitutions for facilities previously certified may be determined to be within the scope of the original certification, additional facilities, as a general rule, will not be considered to be within the scope of the original certification and will require a separate new application which will be subject to the provisions of section 168 (e) (2) of the Internal Revenue Code of 1954. The Certifying Authority may, however, afford a filing date for such separate application which will correspond to the date on which the application for amendment was filed for the facilities found to be outside the scope of the original certification.

(k) *Cancellation or amendment of Necessity Certificate.* The Certifying Authority may (1) cancel any Necessity Certificate where it has been obtained by fraud or misrepresentation or has been issued through error or inadvertence, or (2) amend any Necessity Certificate for sufficient cause.

(l) *Time extensions.* Applications for time extensions on outstanding Necessity Certificates may be considered only if a request for such extension is filed with the Certifying Authority prior to the termination date of the Certificate. Time extensions on Necessity Certificates which have expired by their terms prior to the filing of a request for such time extension may be considered only if the proposed expansion can satisfy the requirements of section 168 (e) (2) of the Internal Revenue Code of 1954.

SEC. 5. *Exercise of powers of Certifying Authority.* (a) Any actions taken in exercise of the powers and authority conferred by section 168 (e) of the Internal Revenue Code of 1954 and vested in the Director of the Office of Defense Mobilization by Executive Order 10480, dated August 14, 1953, may be taken in the name of the Office of Defense Mobilization by the Director's authorized representative.

(b) The Director may for good and sufficient reason in the interest of national defense make exceptions to the requirements for filing in section 4 (d) (2).

ODM Regulation 1, dated December 3, 1953, as amended, is hereby superseded.

Effective date: February 26, 1958.

GORDON GRAY,
Director of the Office of Defense Mobilization.

Approved:
DWIGHT D. EISENHOWER,
The White House.

[F. R. Doc. 58-1626; Filed, Mar. 3, 1958; 8:53 a. m.]

APPENDIX 5

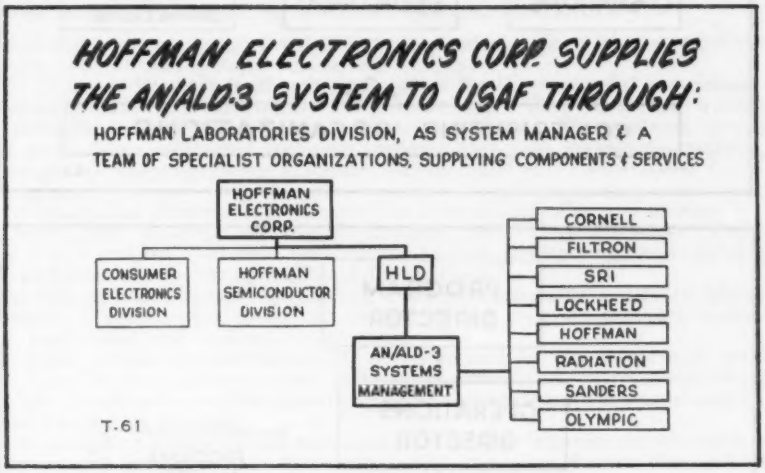
THE AN/ALD-3 ELECTRONIC RECONNAISSANCE SYSTEM DEVELOPMENT PROGRAM

AN EXAMPLE OF GROUP CONTRACTING

Hoffman Laboratories division received the request for proposal for the AN/ALD-3 electronic reconnaissance system from the United States Air Force in May of 1957. Details of this new system are classified. However, it comprises

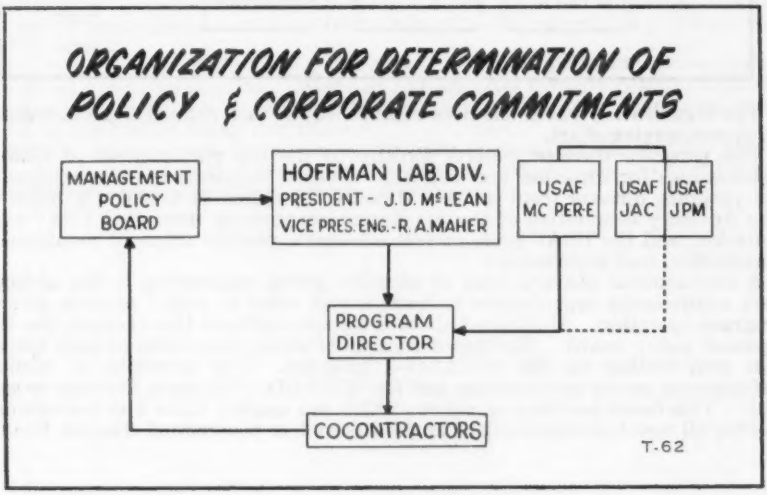
major airborne and ground installations. The Hoffman Co. had been eager for an opportunity to put into practice Mr. H. Leslie Hoffman's concept that a number of specialist organizations could be associated into a team with the combined capability of handling the larger weapons system contracts. And the AN/ALD–3 program provided this opportunity. The Hoffman systems management group had been organized prior to the receipt of this request for proposal. This group made the final selections for the Hoffman team from over 50 qualified candidates. Thereby, the management concepts which Hoffman had developed for just such programs were brought into being.

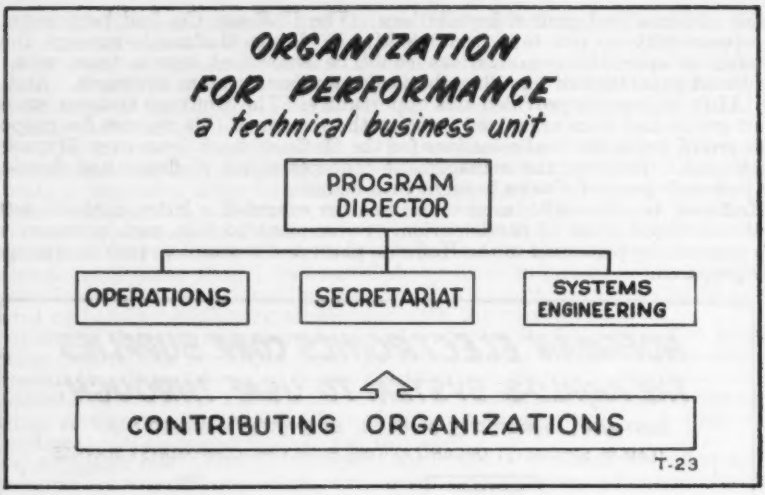
Hoffman, together with each team member executed a letter contract setting forth the broad areas of participation. Subsequent to this, each company sent key engineering personnel to the Hoffman plant and a complete technical proposal was prepared.

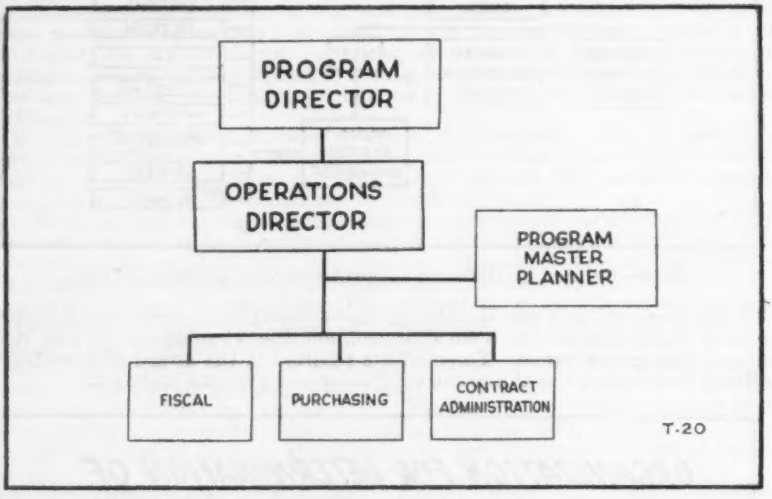


Note—Printed by Hoffman Laboratories, Los Angeles 7, Calif.

The Hoffman systems management group prepared the companion management proposal, which outlined the team approach, and the organization for task definition and task performance. These efforts resulted in the award of a contract to Hoffman Laboratories as the prime contractor and systems manager.







The organization which has been established for task definition is illustrated in an accompanying chart.

The program director reports directly to the top management of Hoffman Laboratories for direction and support. Formal requirements are received by the program director from the Air Materiel Command of USAF (MCPER–E). The Advisory Committee of the Air Force, composed of interested USAF representation, and the USAF joint project managers, provide informal requirements, information, and coordination.

A fundamental characteristic of effective group contracting is the ability of each contributing organization to have a real voice in policy matters affecting program operation. Hoffman Laboratories accomplishes this through the management policy board. The board consists of senior executives of each corporation contributing to the AN/ALD–3 program. The president of Hoffman Laboratories serves as chairman, and the AN/ALD–3 Program Director as secretary. This board provides an agency which can quickly make firm commitments binding all member organizations in matters such as contractual changes, finances,

facilities and manpower, and which can rapidly assess and resolve any other matters which threaten program performance.

The organization for task performance is composed of the Hoffman systems management group and eight contributing organizations. These are:

Cornell Aeronautical Laboratory, Buffalo, N. Y.: Consulting services in human engineering.
Filtron, Inc., Culver City, Calif.: Radio interference, engineering services.
Hoffman Laboratories division, Los Angeles, Calif.: Receiver subsystem.
Lockheed Aircraft Services, Ontario, Calif.: Flight test, installation and support.
Olympic Radio & TV, Long Island City, N. Y.: Recorder subsystem.
Radiation, Inc., Melbourne, Fla.: Ground-support subsystem.
Sanders Associates, Nashua, N. H.: Antenna subsystem.
Stanford Research Institute, Palo Alto, Calif.: Ground data handling programer—control subsystems/consulting services in systems engineering.

These eight companies are directed and coordinated in the performance of their tasks by the Hoffman systems management group.

The Program Director is directly responsible for the successful completion of the program and he is assisted by three executives. They direct the business, communications, and technical management activities. The systems management group is an integrated technical business unit with operational control of the program, receiving policy guidance through Hoffman Laboratories division management.

The Operations Director is responsible for business planning and control * * * the Secretariat Director for communications, records, publications, and reports * * * and the Technical Director for systems engineering, technical direction, and planning the incorporation of future growth.

The Operations Director, in carrying out his responsibilities for the business functions of the program, supervises the efforts of a program planning manager, fiscal, purchasing and contract coordinators.

Programs of this size are frequently overburdened by the paperwork needed for an adequate flow of information. The management and control of communications has therefore become the responsibility of a separate central group supervised by the Secretariat Director.

This group is a communications central, designed to interconnect the activities of the business and technical organizations with the team of associates, and with the Air Force.

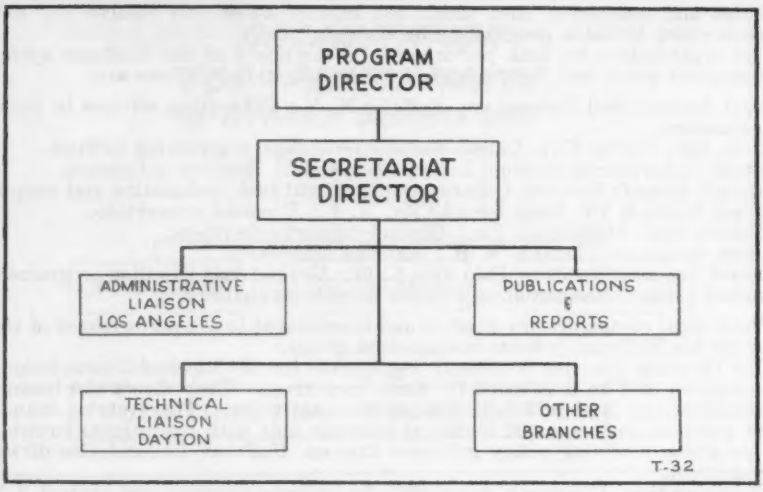
The Technical Director is responsible for the systems engineering, technical direction, and future systems planning for the program.

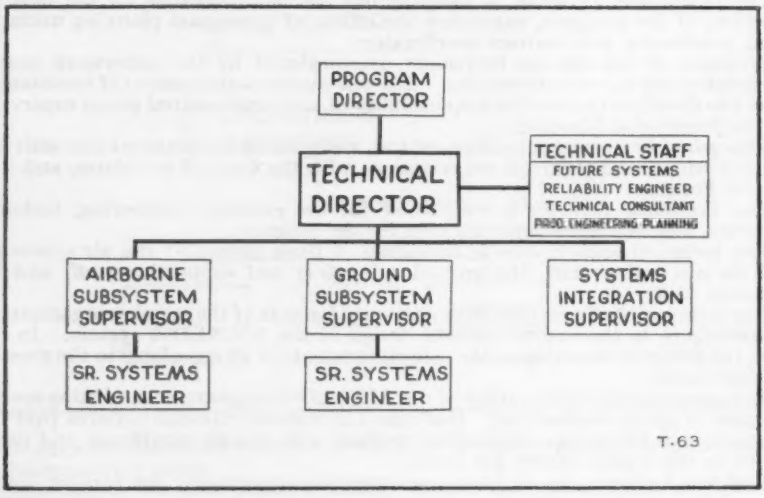
The technical organization is composed of three elements: the air subsystem and its supporting staff, the ground subsystem and supporting staff, and the technical staff.

The technical staff provides an opportunity for each of the member organizations to contribute to the overall systems design of the AN/ALD–3 system. In this way, the program draws upon the collective talents of all associates to the greatest possible extent.

This pamphlet is a brief outline of the AN/ALD–3 program as an existing specific example of group contracting. Hoffman Laboratories division believes that this program, and the group contracting method, will provide significant and useful results to the United States Air Force.

Hoffman Laboratories division welcomes the opportunity for further discussions of its activities on this program. Requests for information must be directed through the cognizant military activity of the inquirer.


PROGRAM DIRECTOR
SECRETARIAT DIRECTOR
ADMINISTRATIVE LIAISON LOS ANGELES
PUBLICATIONS & REPORTS
TECHNICAL LIAISON DAYTON
OTHER BRANCHES
T-32


PROGRAM DIRECTOR
TECHNICAL DIRECTOR
TECHNICAL STAFF
FUTURE SYSTEMS
RELIABILITY ENGINEER
TECHNICAL CONSULTANT
PROD. ENGINEERING PLANNING
AIRBORNE SUBSYSTEM SUPERVISOR
GROUND SUBSYSTEM SUPERVISOR
SYSTEMS INTEGRATION SUPERVISOR
SR. SYSTEMS ENGINEER
SR. SYSTEMS ENGINEER
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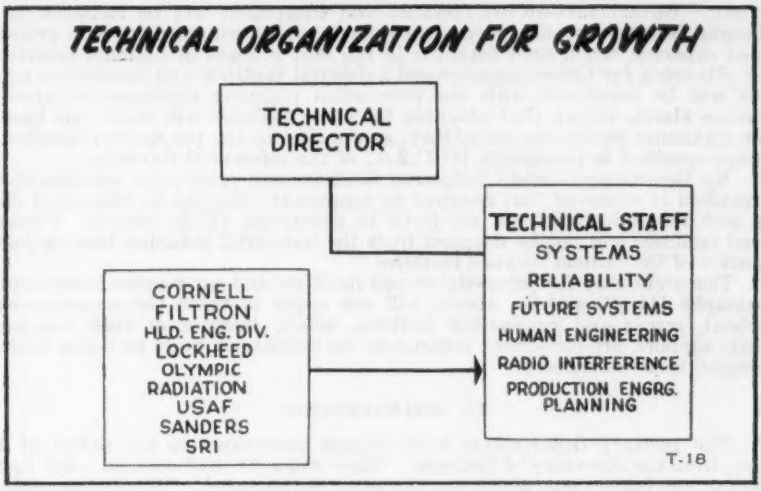

APPENDIX 6

MARCH 27, 1958.
No. 4005.14
ASD (S. and L.)

DEPARTMENT OF DEFENSE DIRECTIVE

Subject: Planning for Government-owned industrial facilities and production equipment.

Reference: DOD Directive 4005.13: Production planning with industry for national emergency or mobilization.

I. PURPOSE

To establish policy guidance for determining the need for Government-owned industrial facilities and production equipment.

II. APPLICABILITY

This policy guidance is applicable to:

A. Government-owned active and inactive industrial facilities.

B. All Government-owned production equipment, whether located in active or inactive industrial facilities or held in reserve storage.

III. POLICY

A. Government-owned industrial facilities and production equipment shall be planned, maintained, and supported only to the extent necessary to support the concept in referenced directive and the industrial base set forth in paragraph III. B., below.

B. The industrial base shall not exceed that needed to support, on the most efficient and economical basis, the combat readiness of the United States military forces, their phased expansion, and the production rates that will satisfy their combat replacement or consumption requirements, as provided in guidance approved or issued by the Secretary of Defense.

C. Reliance for maintaining this industrial base will be in the following order of preference:

1. Privately owned facilities and production equipment.

NOTE.—Contractors will be encouraged to provide all required facilities and production equipment on the most economical basis.

2. Privately owned facilities and associated Government-owned production equipment not available in the civilian economy.

3. Government-owned facilities and production equipment.

NOTE.—Government-owned facilities and equipment will be included in the industrial base for the sole purpose of remedying known deficiencies in privately owned capacity, when such action is in the best interest of national security.

D. Planning for Government-owned industrial facilities and production equipment will be consistent with the production planning guidance contained in reference above, except that planning for these facilities will be on the basis of their maximum production capability, as opposed to the production distribution concept specified in paragraph III.D.2.d., of the referenced directive.

E. No Government-owned industrial facilities and production equipment will be retained in excess of that required to support the concept in referenced directive and the industrial base set forth in paragraph III.B., above. Privately owned facilities will not be dropped from the industrial planning base to justify retention of Government-owned facilities.

F. The preference for privately owned facilities and production equipment in paragraphs III. C. and E., above, will not apply to those Government-owned overhaul, repair and production facilities which, because of their integrated logistic support, are considered organic to the military or must be under military command in an emergency.

IV. IMPLEMENTATION

A. The military departments may request exceptions to the policy of III, above, from the Secretary of Defense. These requests shall contain a full justification of the bases upon which the exception is requested. When disposition of facilities or production equipment might significantly affect national, regional or local economies, the Secretary of Defense will be fully advised in advance of specific action. Report exemption symbol DD-S&L(EXR)76 is assigned to the information required by this paragraph.

B. Each department will implement the policies of this directive within 120 days of the date of the directive, and foward copies of implementing instructions to the Assistant Secretary of Defense (Supply and Logistics).

C. Any future revisions in departmental implementation of paragraph IV.B., above, will be in accordance with the policy contained herein, and copies will be forwarded to the Assistant Secretary of Defense (Supply and Logistics).

NEIL MCELROY, *Secretary of Defense.*

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